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U.S. /NATO SEA-BASED NON-STRATEGIC
NUCLEAR DETERRENCE:
PARADOX OR PITFALL?

by

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Thesis Advisor: Donald Abenheim

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The present study examines the evolution of nuclear strategy with particular emphasis on the capacity of US/NATO sea-based non-strategic nuclear forces. The current trend in NATO towards a certain denuclearization of the Central European states might well place an increased reliance on sea-based theater nuclear weapons to counter Soviet theater nuclear forces in the Western Soviet Union. The present work analyzes the policy background of the NATO nuclear strategy from a European perspective in light of recent problems as a necessary precondition to an understanding of the more concrete issues of hardware. Although the US Navy's nuclear-capable Tomahawk land attack cruise missile (TLAM/N) remains a potent and flexible nuclear strike asset, it is best suited for heavily defended high-value fixed targets. Emphasis on offensive mobility in a future conflict will make carrier-based aircraft a more decisive platform from which to prosecute and destroy high-value mobile targets. However, an analysis of the US Navy's non-

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U.S./NATO SEA-BASED NON-STRATEGIC NUCLEAR DETERRENCE: PARADOX OR PITFALL?

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ABSTRACT

The present study examines the evolution of nuclear strategy with particular emphasis on the capacity of U.S./NATO sea-based non-strategic nuclear forces. The current trend in NATO towards a certain denuclearization of the Central European states might well place an increased reliance on sea-based theater nuclear weapons to counter Soviet theater nuclear forces in the Western Soviet Union. The present work analyzes he policy background of the NATO nuclear strategy from a European perspective in light of recent problems as a necessary precondition to an understanding of the more concrete issues of hardware. Although the U.S. Navy's nuclear-capable Tomahawk land attack cruise missile (TLAM/N) remains a potent and flexible nuclear strike asset, it is best suited for heavily defended high value fixed targets. Emphasis on offensive mobility in a future conflict will make carrier-based aircraft a more decisive platform from which to prosecute and destroy high value mobile targets. However, an analysis of the U.S. Navy's non-strategic nuclear forces reveals substantial deficiencies when compared with those of the Soviet Union. A declining U.S. Navy nuclear stockpile of air-deliverable strike weapons in combination with the lack of a long-range nuclear-capable stealth aircraft weakens the credibility of the aircraft carrier battle group as a nuclear deterrent force.

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I. INTRODUCTION

Dramatic events in late 1989 have transformed the strategic landscape in Central Europe. The most basic objectives of the Atlantic Alliance having been achieved, a unified German state within NATO joins in a far reaching review of the basic purposes, strategies, and organization of the North Atlantic Treaty Organization. A review of the size and tasks of the Alliance's nuclear forces looks forward to a reduced reliance on nuclear weapons in strategy and substantial reductions of nuclear forces, while at the same time acknowledging the essential role they fulfill in a strategy designed to preserve peace.

The new alliance strategy that will succeed flexible response and forward defense is only now emerging, yet it appears clear that the principles of flexible response -- to deter aggression and defend alliance territory, should deterrence fail remain capable to respond in kind at every level along the continuum of deterrence -- shall endure. Yet, the elimination of ground-based intermediate nuclear forces (INF), in addition to the imminent withdrawal of short-range nuclear forces (SNF) will make it more difficult for NATO to maintain credible and flexible response options. The U.S. Navy is more than likely to be called upon to provide the solution,

thereby increasing NATO's reliance on U.S. non-strategic nuclear forces.

This creates a profound dilemma for the U.S. Navy. While the likelihood of war with the Soviet Union has been greatly reduced, the Soviet Union remains the principle U.S. nuclear threat. Significantly, the trend toward a certain denuclearization in Central Europe will strengthen Soviet comparative advantages in geographic and mobilization factors and leave political military outcomes to turn more decisively on the nonnuclear correlation of forces. While recent arms control successes will substantially reduce the size of the armed forces of the Soviet Union, they will nevertheless remain the largest military force in Europe.

It is widely recognized that Soviet sea-based nuclear forces are far more robust than those of the U.S. Navy. Consequently, it is generally agreed that it is in our best interest to avoid nuclear war-at-sea *vis-a-vis* the Soviet Union. To accomplish this goal we have relied heavily on the threat of retaliation against the Soviet Russian homeland as a deterrent against Soviet naval "first-use" of nuclear weapons at sea. Meanwhile, NATO's strategic concepts specifically leave open the option of "first-use" of nuclear weapons, albeit as a "last resort," to prevent a looming conventional defeat in defense of NATO territory. The inherent contradiction between these two policies would make NATO's reliance on sea-based nuclear weapons seem incredible.

It has been a long standing goal of Soviet foreign and military policy to prevent NATO from employing nuclear weapons. And many would argue that it has been the credible threat to use these weapons that has kept the peace in Europe over the past four decades. Although nuclear weapons may serve largely as political instruments, properly formulated military options are essential for enhancing the political credibility of the U.S. strategic nuclear guarantee.

This thesis examines the increased role of U.S. sea-based non-strategic nuclear forces in support of NATO's emerging strategic concepts. It begins with an attempt to better understand the reasons behind the developing trend toward denuclearization in Central Europe which appear to stem largely from a "delegitimization" of nuclear deterrence policies in Germany. The doctrine of flexible response is reviewed as well as the military-political issues that will shape future strategy. The non-strategic nuclear balance in Europe will be examined with special emphasis on the capabilities of U.S. naval nuclear weapons stockpiles and nuclear-capable air strike assets. Finally, conclusions are reached as to whether a credible sea-based non-strategic nuclear deterrent force is possible.

II. THE DENUCLEARIZATION OF EUROPE

The withdrawal of Soviet forces from East-central Europe has once again brought the issue of nuclear weapons deployments to the forefront of alliance politics. On 3 May 1990 President George Bush announced his decision to forego the follow-on-to-*Lance* missile program in addition to the cancellation of any further modernization of U.S. nuclear artillery shells deployed in Europe. These steps were followed two months later by a proposal that was announced at the July 1990 NATO London Summit meeting to eliminate all nuclear artillery shells from Europe, in exchange for reciprocal action by the Soviet Union. This unprecedented series of events is a reflection not only of the significant decline in the perceived Soviet threat to Western security, but also the willingness of the Atlantic Alliance to reinforce Soviet initiatives and reduce their own defense expenditures.

Once the remaining Soviet forces stationed in the eastern portion of united Germany have been completely withdrawn (Soviet troops are scheduled to leave by the end of 1994), and the Conventional Armed Forces in Europe (CFE) Treaty is fully implemented, some observers have suggested that U.S. nuclear weapons also be withdrawn from Central Europe. (Halperin, 1990, sec.4, p.19) Others, however, would argue that "strictly

speaking the can be no exclusively 'conventional stability.' A credible nuclear component remains necessary even in times of conventional disarmament, if war as an instrument of politics is to be excluded." (Kaiser, 1989, p.136)

Chances are there may still be some dual-capable medium-range aircraft based in Europe -- specifically, U.S. F/B-111s stationed in the United Kingdom along with the possibility of adding some F-15 *Eagles* to provide tactical support. But these aircraft have sometimes been criticized for being inadequate to provide full target coverage against increasingly sophisticated Soviet air defenses. (Daalder, 1988, p.277) Of course, NATO would like to modernize these aircraft by providing them with short-range nuclear tactical air-to-surface missiles (TASM) which would make them all the more effective. However, many European statesmen view the introduction of a TASM as politically untenable in the "New Europe." One aide to German Foreign Minister Hans Dietrich Genscher, for example, called the idea simply "ridiculous." (Friedman, 1990, p.A7)

By far the largest number of U.S. nuclear weapons in Europe are kept in the Western part of Germany, roughly 64 percent of the total U.S. nuclear stockpile in NATO. Sources outside the U.S. government estimate there are about 1,285 nuclear artillery shells and nearly 500 air-deliverable gravity bombs deployed there. (Norris[c], 1990, p.48) This compares to approximately 15 nuclear artillery shells and 200

bombs in Italy, 60 artillery shells and 25 bombs in Greece, ten artillery shells and 25 bombs in the Netherlands, and 80 artillery shells and 200 bombs in Turkey. The Italian and Dutch governments have expressed a desire to eliminate the short-range weapons citing the fact that such weapons could only now fall on their newly democratic neighbors to the East. (Economist, 1990, p.48) In addition, Germany's position in the heart of Europe has generally made it the key to dominating the politics of Europe. Moreover, much of NATO's strategy has been guided by assumptions concerning West German political and military needs. (Asmus, 1989, p.v) Thus, the most important decision among NATO's non-nuclear members on whether or not to maintain air deliverable gravity bombs and/or accept new tactical air-to-surface missiles will take place in Germany.

A June 1990 *Economist/Los Angeles Times* poll in Western Germany found that there is little public support for the deployment of nuclear weapons in Germany. More than half of those Germans polled (54%) believe nuclear weapons should be removed from German soil. This is reduced only slightly (to 42%), when it is pointed out that the United States might decide to withdraw its troops from the country without nuclear protection. When asked whether the respondents thought that as a military deterrent only a few nuclear weapons should remain in Germany, that is, only the types that are launched from aircraft, not the land-based missiles, almost half (49%),

answered that an air-launched missile option was not a good solution. (*Economist*, 1990, p.46)

It has been postulated that a tendency toward a certain "delegitimization" of nuclear deterrence has emerged in some important sectors of the elite and attentive publics in some Western countries such as Germany. This "delegitimization" has been defined a "reduced confidence in the reliability and safety of nuclear deterrence arrangements and lessened certainty about the practical prudence, strategic necessity, and/or moral legitimacy of posing nuclear threats to adversaries." (Yost, 1990, p.487) Of these elements, NATO has relied most heavily upon the argument of strategic necessity to legitimize its nuclear deterrence policies. For nearly four decades NATO has used the compensatory function of nuclear weapons as the central argument in justifying and politically implementing nuclear deterrence. Since the Warsaw Pact's conventional superiority was real, this argument was convincing even to many skeptics. (Kaiser, 1989, p.135) As long as this perceived threat existed, arguments of those favoring the elimination of nuclear weapons as well as questions about the legitimacy of nuclear deployments could be overcome in the name of effective deterrence. No doubt that is why today many politicians believe that nuclear arms in Western Europe can be reduced, or eliminated, given the build-down to near conventional parity that will accompany implementation of the CFE agreement.

The origins of this delegitimization of nuclear deterrence in West Germany are not well understood, however, some of the apparent changes in contemporary attitudes have their roots in the more distant past, to be sure. Two distinct periods in the brief history of German nuclear policy appear to have made a lasting impression for all future German nuclear policy decisions, and shall be discussed here. First, is the initial decision process to accept NATO nuclear weapons deployments in the mid-1950s. Second, the debate surrounding NATO's 1979 "dual track" decision and the deployment of Intermediate-range Nuclear Force missile that followed.

A. THE ORIGINS OF WEST GERMAN NUCLEAR POLICY

International developments in the late 1940s and early 1950s suggested that the Soviet Union intended to capitalize on the defeat of Nazi Germany to shift the global balance of power in its favor. Following the Berlin Crisis in 1948, the Soviet detonation of an atomic bomb ended the United States nuclear monopoly and created an atmosphere that grew even more disturbing for the West when the North Koreans attacked South Korea on 25 June 1950. The United States along with its weakened British an French allies worried that "what appeared to be a Soviet-led feint in Asia was the prelude to a worldwide Blitzkrieg." (Abenheim, 1988, p.42) It was unlikely that the recently established North Atlantic Treaty

Organization (NATO) could prevent a Soviet advance to the English Channel and the Pyrenees.

American ground troops that remained on the continent were considered inadequate to fight a Third World War, leading most U.S. planners to conclude that the best option would be a strategic retreat--from the continent if necessary--followed by a U.S. led retaliation with atomic weapons clearing the way for another Normandy type re-invasion of the continent. Europeans privy to these plans rejected the notion of any retreat, calling instead for a strengthening of the Atlantic Alliance. With this goal in mind the North Atlantic Council held its ninth session in Lisbon, Portugal, in February 1952.

At the Lisbon meeting the allied ministers adopted, with relatively little discussion, the report of the so-called "Three Wise Men,"--Averell Harriman of the United States, Sir Edwin Plowden of the United Kingdom, and Jean Monnet of France--on the economic burdens of rearmament and future plans of the alliance. Although NATO's military plans for the defense of Europe called for approximately 9,000 aircraft and 100 divisions their report concluded that a total of 50 divisions with 4,000 aircraft and strong naval forces was the most NATO could aspire to by the end of 1952. (Richardson, 19, p.32) Additionally, it was understood by the Council that these forces needed to be increased to essentially 96 divisions by 1954. To do this the West would need the Germans.

The Lisbon force goals, as they came to be known, were an attempt by the allies to address the postwar realization that Soviet de-mobilization had been much less thorough than expected. United States intelligence estimates of Soviet military strength in Europe, although crude and imprecise, consistently assessed the number of Soviet divisions to be 175-200, with 20,000 operational aircraft scattered throughout the region. The Soviets were also credited with having more than 400 submarines, with which they could make resupply and reinforcement from North America very hazardous. To these estimates could also be added the forces of East European satellite states, consisting of 75 to 80 divisions and about 2500 operational aircraft.[1] For the Western allies, the Lisbon force goals amounted to little more than wishful thinking considering that all were faced with enormous postwar financial and resource burdens, not to mention European colonial interests in North Africa and the Middle East which also diverted a considerable number of military and financial resources away from NATO purposes.

In the United States, a newly elected President Dwight D. Eisenhower, having recently returned to the U.S. from his position as the first Supreme Allied Commander Europe (SACEUR), immediately began to craft a national security

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[1] Soviet force level data extracted from remarks made by General Alfred M. Gruenther, SACEUR, before the Bonn Economic Policy Club, on May 9th, 1956, as published in the *NATO Letter*, Vol. 4, No. 6, (June 1956), 36.

strategy for the United States that could meet the Soviet threat while at the same time avoiding any serious weakening of our nations economy with relatively costly conventional military capabilities. The resulting U.S. strategy placed increased reliance on the use of nuclear armaments to rationalize significant manpower reductions (the most expensive component of the military). This strategy was set forth in October 1953 in a National Security Council paper (NSC 162/2) on *Basic National Security Policy*, also known in public circles as the "New Look." Eisenhower's "New Look" was introduced to the public by Secretary of State John Foster Dulles on January 12, 1954. In a statement before the Council on Foreign Relations, Secretary Dulles emphasized that in order to get "a maximum deterrent at a bearable cost," the United States had decided to "depend primarily upon a great capacity to retaliate, instantly, by means and at places of or choosing." (U.S. Department of State, 1954, p.103) In economic terms it was argued that the U.S. had opted for a strategy that offered "more bang for the buck."

In early 1954, General Alfred M. Gruenther, Eisenhower's replacement as SACEUR, presided over a study of the feasibility of shifting NATO's strategy to place primary focus on nuclear weapons in keeping with the spirit of the New Look. Though never declassified, the results of the study were leaked to the press and by all accounts, the resulting report provided ample justification for building a strong NATO

nuclear posture. (Schwartz, 1983, p.32) This classified report became the basis for the North Atlantic Council's ominous December 1954 endorsement of a "New Look" for NATO, a strategy of massive retaliation using nuclear weapons "of all sorts" against the Warsaw Pact once attacked, irrespective of whether or not the Pact used them. (Schwartz, 1983, p.32) The formal NATO document which outlined the new strategy (MC 48 in NATO parlance), was titled "The Most Effective Pattern of NATO Military Strength for the Next Few Years." This title seemed to imply that the new NATO strategy was only a temporary measure until NATO conventional forces could be sufficiently strengthened and did not constitute, at least to some European representatives, that nuclear weapons represented a permanent solution to NATO's strategic dilemma.

Concurrent with this transformation in NATO's strategic doctrine was the rapid technological development of tactical nuclear weaponry. Armaments such as nuclear capable 280mm artillery, smaller and lighter air-deliverable nuclear gravity bombs, anti-aircraft missiles, and Mace and Matador atomic cruise missiles were rapidly becoming part of the allied arsenal in this period. General Gruenther directed the NATO planning staff at Supreme Headquarters Allied Powers Europe (SHAPE) to formulate a defensive strategy utilizing these newly acquired capabilities as guided by the precepts established in NSC 162/2. Thus, between 1953 and 1956 the American led strategists at SHAPE worked on a new approach for

the defense of Europe. Their findings indicated that: "In an atomic defense, the brunt of needed forces are those to service the firepower, to force the enemy to form a target, and to identify the target. The Lisbon force goals were more than sufficient for these requirements." (Richardson, 1981, p.41) The proposed strategy would require only 30 combat ready allied divisions so long as the divisions would be armed and equipped with the most modern tactical nuclear weapons. The purpose of allied ground forces in the new strategy, according to Brigadier General Robert C. Richardson III, USAF, a planner in SHAPE Headquarters from 1952 to 1955, was to effectively "shield" NATO territory in a defensive holding action using tactical nuclear weapons as necessary, pending the outcome of the strategic nuclear battle, which of course was to be conducted largely between the two superpowers. (Richardson, 1981, p.41) In this manner the twin concepts of deterrence and defense could be united into a single coherent strategy. After a lengthy review process, the NATO Standing Group formally adopted the new tactical nuclear plans as official NATO doctrine in the form of documents MC 14/2 and MC 70 eventually leading to a revision of the Lisbon force goals downward by 1957. (Schwartz, 1983, p.32)

In the midst of this fundamental policy shift the North Atlantic Treaty Organization formally admitted two new alliance members: Italy and the Federal Republic of Germany. For Germany in particular, the May 5, 1955, accession into

NATO was an important development not only because NATO membership brought with it increased political status for the Federal Republic in Western Europe but also because it increased the Adenauer government's chances of achieving its two other major foreign policy goals: security and German reunification. Along with these political gains however, came genuine liabilities as well. NATO was rapidly becoming a nuclear alliance, a reality for which the Adenauer government seemed reluctant to acknowledge as part of the alliance package.

Critics have charged that, "Throughout the 1955-56 period Adenauer and [Defense Minister] Blank seemed confused about the implications of the New Look for West Germany." (Schwartz, 1983, p.43) However, it appears that during this same period Washington issued tacit assurances to Adenauer and other European leaders that if war did break out, "first priority" would be given by the American leadership to launching the U.S. Strategic Air Command (SAC) bombers to "blunt" the Soviet initial threat while NATO ground forces held the line along the Central Front.[2] From a European perspective, such a move would rapidly escalate the conflict into a global strategic

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[2] For a detailed account of U.S. nuclear policy during the Eisenhower administration see David Alan Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945-1960," *International Security*, Vol.7, No.4, (Spring 1983).

nuclear exchange between the two superpowers, largely overshadowing any holding action along the Central Front.

Additionally, many West German government officials and military leaders were convinced that an adequate conventional defense could be mounted to counter what Germans perceived as the major threat to European security--the possibility of a large-scale Soviet invasion, most probably a massive tank assault, in the Central region. Discussions had taken place as early as October 1950, when Chancellor Adenauer directed a group of his closest military advisers, led by former armor General Gerhard von Schwerin, to covertly devised a plan of action for German rearmament and defense within a European security framework. The plan, as it was described in the so-called "Himmerod memorandum," suggested using 12 German armored divisions integrated with the Western allies as part of a mobile-enveloping force. These units would be deployed as near to the interzonal border as operations would allow and would constitute in NATO terms a "forward defense." (Abenheim, 1988, p.54) Given the country's narrow territorial dimensions, the Federal Republic's strategic dilemma has always been that it cannot trade space for time. This left little choice for German strategists but to pursue a forward strategy.

Indeed, in 1955 West German rearmament plans called for the build-up of 12 large armored divisions designed to confront a massive Soviet tank assault. NATO's American strategists argued that these divisions should be somewhat

smaller in size to allow for the greater mobility required on the atomic battlefield, that would also give NATO commanders increased flexibility to detach and disperse units more readily if and when their units should come under nuclear attack. German Army officials were reluctant to comply with the changes suggested by NATO, nevertheless, by the end of 1955, under pressure from the civilian leadership within the Defense Ministry, they agreed to make the requisite changes that would construct a West German Army more compatible with the NATO New Look. (Schwartz, 1983, p.43)

The commanders at SHAPE wasted little time in demonstrating alliance strategic concepts to their new West German partner. Operation "Carte Blanche," held in June 1955, just one month after the Federal Republic became an alliance member, simulated the Western allies response to **Soviet tactical nuclear attacks** against military targets in the Low countries, northeastern France, and the Federal Republic of Germany. The attack scenario was based on an assumption that Soviet TU-16 "Badger" medium range bombers, which became available in large numbers in early 1955, would lead an attack by dropping atomic bombs on primary allied airfields and command facilities. The American led planners at SHAPE imagined that if the Soviets decided to risk a life and death struggle, they would use atomic weapons at once, and in full force. The allied response simulated dropping more than 100 targets between Hamburg and Munich, resulting in 1.7 million

Germans killed, 3.5 million wounded, and countless additional casualties resulting from fallout. (Kelleher, 1975, p.40) The event forced the issue of NATO's nuclear strategy onto German consciousness, creating widespread unrest and agitation in the public and volatile debate in parliament that lasted for several years to come.

Catherine Kelleher, in her book *Germany and the Politics of Nuclear Weapons*, which is based largely on personal interviews with German Defense Ministry officials and government elites between 1965 and 1966, describes the German military reaction to Carte Blanche as "cool and offhand," revealing "after all, nothing revolutionary, just evidence of new levels of destructive power." (Kelleher, 1975, p.40) The majority view of these officials, most of whom were army officers, was that "Carte Blanche reflected all too well the limited combat experience and American predilection for airpower that had fostered NATO's ill-advised decision of December 1954." (Kelleher, 1975, p.41) Most officials held the belief that a future conflict would broadly resemble the outline of World War II except on a larger, more destructive scale. In light of the perceived threat to European security and with consideration towards the probable character of a future conflict, most West German defense officials concluded that: "*Nuclear weapons* would <u>not</u> play a decisive role in such a conflict; their *primary significance would be in the strategic sphere*, especially in retaliatory attacks against

the Soviet homeland. The new tactical nuclear weapons--about which very little was known-- might provide increased strength once *problems of radiation effects, reliability, and logistics* could be solved." (Kelleher, 1975, p.41)

The West German Army clearly did not perceive a tactical advantage to be gained from the "instantaneous" use of tactical nuclear weapons to counter the Soviet threat given the unresolved problems associated with the use of nuclear munitions. Although they held open the prospect that tactical nuclear weapons might someday prove useful as a force multiplier, their overriding concerns about the safety and reliability of these new weapons made them impractical for use on what they considered to be predominantly a conventional battlefield. These officials were also quick to note that nuclear weapons were best suited for the strategic level of conflict which they agreed would be conducted between the two superpowers.

Debate in the Bundestag, following decisions to rearm the Bundeswehr and to join NATO, shifted from conventional rearmament to the deployment of U.S. nuclear weapons in Germany. Throughout the Summer of 1956 the government argued for a build-up of conventional forces. In July, however, a *New York Times* report charged that Chairman of the Joint Chiefs of Staff, Admiral Arthur Radford, had circulated a memorandum proposing the withdrawal of significant numbers of American troops from Europe. The report triggered alarm in Bonn because

without substantial numbers of American ground forces, the conventional defense of the central region, still considered feasible by some Defense Ministry officials, would be nearly impossible. The American government denied any intention to reduce or remove American forces without the prior approval of NATO, but did not repudiate the central objective of the Radford Plan: to substitute nuclear deterrence for conventional defence. (Osgood, 1962, p.42)

In response to this objective, Chancellor Adenauer strongly criticized the NATO shift in emphasis from conventional forces to nuclear arms as a "mistake," further warning that to counter an East German invasion of West Germany with nuclear weapons would almost certainly "trigger an intercontinental rocket attack." (Osgood, 1962, p.41) Although this warning came before the advent of Soviet or American ballistic missile capabilities, causing some to wonder about Adenauer's faculties, his message of escalation was clear. Wolfram Hanrieder noted a subtle shift in the Bonn governments position "from arguing that German rearmament would help deter Soviet aggression to stressing that it would help in deterring nuclear war." (Hanreider, 1989, p.42)

Although still unequivocally opposed to atomic armaments in his public pronouncements, Dr. Adenauer soon decided that Germany would best be served by joining the overwhelming trend toward nuclear deterrence. The Chancellor was in receipt of enormous domestic political pressure from within his own

Christian Democratic Union (CDU) and its Bavarian sister party the Christian Socialist Union (CDU) to cut away from the national and international liabilities which critics had felt Minister of Defense Blank's "ineptitude" produced. (Kelleher, 1975, p.47) Late in September, Bonn reacted to the pressure with a cabinet announcement to reduce the conscription period from 18 to 12 months. This measure would effectively reduce the planned size of the Bundeswehr's total force from a goal of 500,000 men, set in early Summer, to 325,000 men. The following month it was also announced that Franz Josef Strauss, a CSU defense expert and Cabinet Minister of Atomic Matters (noted for his early appreciation of the new NATO strategy and forceful advocacy of a German role in the disposition of alliance nuclear weapons), would replace Blank as Defense Minister.

In October 1956 a series of international events further prompted Chancellor Adenauer to seek even closer ties with NATO and the United States. First, the Suez crisis in the Middle East (in which the Soviet leadership threatened to rain nuclear missiles on London and Paris) underscored Germany's reliance on U.S. strategic nuclear weapons, and; Second, the Soviet use of force to crush the Hungarian uprising exposed Soviet attempts toward a peaceful settlement of the "German Question" as insincere. These recent international events reaffirmed Adenauer's conviction that Germany's future was tied to the West. It became clear that without U.S. strategic

nuclear weapons and the threat of their use the defense of Berlin and all that it stood for would be nearly impossible. By the end of the year, a turnaround of Adenauer's nuclear policy was effectively complete when the Federal Republic joined Britain and France in requesting access to U.S. nuclear weapons under NATO auspices. (Schwartz, 1983, p.44)

A resounding victory for the CDU/CSU in the third federal elections to the Bundestag in September 1957 demonstrated public confidence in the decisions and policies of the Adenauer government despite its recent reversal on nuclear deterrence issues. Bonn, riding the tide of approval from the Fall election, continued to press forward with the rearmament program of the Bundeswehr, which was scheduled to include arms Adenauer euphemistically termed "the most modern weapons."

At a November press conference, Defense Minister Strauss declared that since the alliance had assigned German forces a "fundamentally tactical mission," the only types of modern equipment sought by Germany would be "tactical weapons." More specifically the German government was interested in dual-capable "anti-tank rockets, surface-to-surface tactical missiles, guided missiles for air defense, and missiles which could replace tactical bombers and long-range artillery, that is with a range under 1,250 miles." (Kelleher, 1975, p.97) This range limitation was an important distinction for the FRG because it would prohibit direct attacks on Soviet territory from German soil. The very next month Strauss took this

atomic shopping list with him on an official visit to the United States. Upon his return he announced the government's intent to equip the West German armed forces with Matador C nuclear capable cruise missiles and Nike-Ajax dual-capable air defense missiles, both under dual key arrangements with the Americans. (Schwartz, 1983, p.71) In keeping with the fundamentally tactical mission of the Federal Republic, the Defense Minister quietly turned down a broad U.S. offer to deploy Thor and Jupiter Intermediate- and Medium-Range Ballistic Missiles (IRBMs and MRBSs) in Germany, thought by Adenauer and others to be inappropriate. Nevertheless, the Strauss announcement touched off a firestorm of anti-nuclear criticism and sparked one of the most heated and emotional parliamentary debates in the short history of the Federal Republic.

In the Bundestag, the Christian Democrats, led by Adenauer and Strauss, used two principal arguments to justify their advocacy of nuclear armaments. The first was that German forces must possess the "most modern weapons," equal to those of other NATO shield countries lest the Federal Republic would become the weak link in NATO's defensive structure, ultimately inviting the Warsaw Pact to strike at this weakness. This line of reasoning remained consistent with Adenauer's established foreign policy goal of achieving equality for the West German state among the other West European allies, arguing that a failure to obtain nuclear weapons for Germany

would undermine the government's efforts. A second CDU/CSU argument was that as an important member of NATO, Germany needed to possess weapons that were just as strong as those of its potential opponent in a conflict or the consequences would be disastrous. They argued that it would be incomprehensible for the Bundeswher to send its soldiers into combat without the necessary weapons to effectively defend themselves. Both of the ruling party rationales stressed the importance of achieving equality for the Federal Republic in the European security system, using nuclear armaments as the primary instruments to accomplish this much sought after foreign policy objective.

The opposition Social Democratic Party (SPD), on the other hand, was strongly opposed to the deployment of any nuclear weapons in Germany. Led by Fritz Erler, Erich Ollenhauer, and a young Helmut Schmidt, the SPD argued against nuclear armaments on moral grounds, considering the acceptance of nuclear weapons as the equivalent of committing German atomic suicide. But, even more importantly, the Social Democrats based their argument on the contention that nuclear arms in Germany would undermine Germany's chances for reunification (an argument also emphasized by the Soviet Union in their anti-nuclear rhetoric). A four-day defense debate in the Bundestag came to a head on March 25, 1958, when the Adenauer coalition government prevailed in voting split solidly along party lines. The parliamentary victory for the CDU/CSU

coalition resulted in the passage of the so-called "March Resolution" which states:

> In accordance with the requirements of this defensive system (the North Atlantic defense community) and in light of the armament of the possible opponent, the armed forces of the Federal Republic must be so equipped with the most modern weapons that they are able to fulfil the obligations assumed by the Federal Republic within the NATO framework, and to make, in an effective manner, the necessary contribution to the securing peace. (Kelleher, 1975, p.113)

The consensus that was given to the "March Resolution" in the Bundestag marked what might be called the official "legitimization" of nuclear deterrence in the Federal Republic of Germany. Whatever Bonn's doubts or specific military interests, it had to adopt prevailing American and NATO concepts in order to attain the U.S. strategic nuclear guarantee. In light of the magnitude of the perceived Soviet threat to German security, the government of Chancellor Adenauer concluded that its choices were rather limited: Either accept NATO doctrine and thereby gain recognition in the West as an equal alliance partner, or fall to the mercy of Soviet Union. Given the Federal Republic's vulnerable position at the fulcrum between East and West, the choice was not difficult.

This decision would triggered an unprecedented upheaval in German domestic politics as the SPD tried to reverse the governments course by taking the issue to the streets. Polls indicated that some 80 percent of the West German population

opposed atomic missile bases **of any kind** on German territory. (Schwartz, 1983, p.72) The Social Democrats helped launch a broad anti-nuclear campaign *Kampf dem Atomtod* ("Fight nuclear Death") which "sought to rally the electorate around the notion that nuclear weapons, in addition to being unethical, would diminish rather than enhance West German security." (Joffe, 1981, p.14) To counter the anti-nuclear drive, the Adenauer government began a public relations campaign of its own which discredited the antinuclear campaign by equating the goals of the SPD with those of the Soviet Union and the GDR. (Joffe, 1981, p.83) This crude but effective message was successful in settling the issue in the government's favor by the end of summer.

The Atomtod campaign effectively came to an end when the "atomic" CDU won a majority vote in the North Rhine-Westphalia *Land* elections, previously regarded as an SPD stronghold. The electoral upset had a profound effect on the Social Democratic party, resulting in a total reevaluation of the party's political platform. At the following SPD party congress in November 1959 the SPD shifted its political strategy and effectively reconciled itself to the division of Germany, membership in NATO, and to the American military (and nuclear) presence in the Federal Republic in order to win political power. (U.S. Defense Nuclear Agency, 1990, p.14) Thus, by 1960 militant domestic opposition concerning the legitimacy of nuclear deterrence in Germany had all but ceased.

Although initially opposed to nuclear armaments, the Audenaur government resigned itself to the strategic reality that in light of Soviet capabilities and intentions at the time, nuclear weapons were the only means available with which to deter the Soviets from seizing Berlin and continuing through the inter-german border. An important aspect of this decision process is that the Adenauer government was able to pass such measures through the Bundestag although the majority of the public disagreed with the government's position. This phenomenon has been explained by the wide gulf that separated the individual german from his government in the early postwar years. Today, however, successor generations are much more active in democratic government and would never allow a similar situation to occur.

B. THE "EUROSTRATEGIC" NUCLEAR BALANCE

If one were to give a date for the rebirth of the public debate on nuclear deterrence in NATO it would have to be May 10, 1977, the day of the NATO Summit meeting in London. It was at this that meeting West German Chancellor Helmut Schmidt informed the other alliance heads of state that, in his view, NATO strategy was about to enter a new phase of reduced reliance on strategic nuclear forces. His remarks illuminated a growing crisis of confidence among NATO's European allies in the credibility of the American strategic nuclear guarantee since President Jimmy Carter entered the White House in

January with a commitment to radically reduce nuclear weapons (exemplified by his call for complete nuclear disarmament in his inaugural address).

Chancellor Schmidt's remarks outlined two previous phases in alliance strategy over the past twenty years. The first phase, he described as being in the late 1950s and 1960s when emphasis was "placed on deterrence rather than defence, . . ." Moreover, he explained that the credibility of this nuclear deterrence arrangement was possible only because of Western nuclear superiority at a time of inferiority in conventional forces. (Schmidt, 1977, p.177) During this initial phase of alliance strategy, as Soviet nuclear capabilities increased, it became apparent that allied confidence in the U.S. nuclear guarantee was in decline. This was demonstrated most clearly by British and French efforts to develop independent national nuclear strength. The West German government, however, having been sworn against the development of any kind of national nuclear capability, instead became increasingly dependent on the American extended nuclear guarantee. An abortive attempt in the early 1960s to increase German access and control of nuclear weapons by establishing a NATO multilateral nuclear force (MLF), succeeded only in drawing added attention to Germany's special vulnerabilities. Nevertheless, in 1968, as a consolation of sorts for the collapse of the MLF project, NATO instituted the Nuclear Planning Group (NPG) giving West Germany a more influential role in NATO's nuclear planning and

decision making process. This measure, combined with the French decision to withdraw from the integrated alliance structure in 1966, elevated the position and status of the Federal Republic in the Atlantic Alliance, making Germany the most important continental European ally of the United States. For Germany this more prominent role in the alliance helped to ease German concerns about the reliability of its nuclear deterrence arrangements with the U.S. in NATO, at least temporarily.

Changes in the alliance structure following the withdrawal of France in 1967 also led to changes in alliance strategy. NATO adopted the doctrine of "Flexible Response" in 1967, beginning what Chancellor Schmidt declared as a second phase in alliance strategy. Schmidt called 'flexible response' a "strategy of both deterrence and defense," based on a combination of first, strategic nuclear forces; second, the so-called tactical nuclear forces; and third, conventional military forces. (Schmidt, 1977, p.178) The new NATO strategic doctrine sought to deter aggression across the spectrum of armed conflict through the maintenance of an appropriate mix of both conventional and nuclear forces. The new strategy was designed to give NATO leaders a range of options below the level of massive U.S. strategic nuclear strikes. These options were believed to strengthen deterrence because they would provide an unbroken chain from theater nuclear war to strategic nuclear war. (Thomson, 1984,p.602) Schmidt argued

extensively as both an SPD party spokesman in the early 1960s and later as defense minister for Willy Brandt, for an increase in NATO's conventional defense posture, opposing any massive nuclear response to conventional Warsaw Pact aggression.[1]

Schmidt continued with his remarks by predicting that NATO would soon be entering a third phase in the continual evolution of its strategy, a phase that would place greater emphasis on the third component of the "flexible response" triad, conventional military forces. The Soviet build-up of intercontinental ballistic missile (ICBM) capabilities between 1967 and 1977 had undeniably created a certain "parity," otherwise called "essential equivalence," of strategic nuclear forces between the Soviet Union and the United States. To Schmidt, this transformation of the strategic balance, once stabilized in the form of a SALT II agreement, would make it necessary to "reduce the political and military role of strategic nuclear weapons as a normal component of [NATO] defense and deterrence." (Schmidt, 1977, p.178) Schmidt explained the rationale behind his supposition was that "the strategic nuclear component will become increasingly regarded as an instrument of *last resort, to serve the national interest* and protect the survival *of those who possess these weapons* of last resort." (Schmidt, 1977, p.178) [Emphasis

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[1] See Schmidt, Helmut. *Defense or Retaliation: A German View*, Praeger, 1962.

added] It was feared the Federal Republic would be excluded from such an arrangement because it did not possess these instruments of "last resort" and by implication the future reliability and credibility of extended deterrence arrangements with the United States under new conditions of superpower nuclear parity were in doubt. In this phase the legitimacy of nuclear deterrence was severely weakened.

Exacerbating the strategic dilemma posed by "parity" was the Soviet deployment of newly developed SS-20 "*Saber*" (Soviet designation RSD-10 Pioner) mobile intermediate-range ballistic missiles in the Spring of 1977 to complement their modern medium-range "*Backfire*" bombers that had begun deployments two years prior. The Soviet SS-20 missile represented a tremendous advance in long-range theater nuclear force modernization for several reasons. First, because it was mobile and therefore almost invulnerable; second, the transporter erector-launchers could be easily reloaded; third, each missile could deliver three independently targetable nuclear warheads with a high degree of accuracy; and fourth, it had a range estimated to be as high as 3000 nautical miles (5,000km). The TU-26/TU-22M "*Backfire*" bomber, first introduced in 1975, had a greater range, 2100 nautical miles (approx. 4,000km), than either of its predecessors the TU-16 "*Badger*" and the TU-22 "*Blinder*," plus it could fly at high subsonic speeds (Mach 0.9) at low altitudes, increasing its survivability and ability to penetrate NATO air defenses under combat conditions. These

capabilities gave the Soviets serious improvements in the employment flexibility of their nuclear forces and put them in a position to counter NATO's nuclear employment options at every level of conflict. (Thomson, 1984, p.602)

The *Backfire* bomber was thought by a majority of U.S. intelligence analysts to be capable of performing intercontinental strategic bombing missions if refueled in-flight. Therefore, some American arms control advocates wanted the *Backfire* to be limited under SALT II. The Soviet Union on the other hand, wanted to place constraints on U.S. cruise missile programs, including a ban on long-range ground and sea-launched cruise missiles (GLCMs and SLCMs) it considered strategic weapons. (Thomson, 1984, p.603) Both Americans and Europeans in the defense establishment extolled the merits of this new generation of high technology cruise missiles as a way to improve NATO's flexible response capability, substituting cruise missiles for tactical air forces in theater nuclear strike roles. [1] Reassurances by the Soviet Union that the Backfire would *only* be deployed against Western Europe in exchange for American promises to limit cruise missile deployments made many Europeans fear that the United States was suggesting to the Soviets, without meaning to do so, that American and European security could be decoupled.

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[1] For a full discussion of the subject see Holst, Johan J., and Uwe Nerlich, eds. *Beyond Nuclear Deterrence: New Aims, New Arms*, (New York: Crane, Russak, 1977).

Chancellor Schmidt became more worried that as a result of strategic nuclear parity between the two superpowers in combination with the growing number of Soviet theater nuclear forces, or as he preferred to call them, "Eurostrategic" nuclear weapons, the Soviets would use these weapons as instruments of "political blackmail against Germany." (Herf, 1990, p.54) According to Schmidt, President Gerald Ford had understood and shared his concern about the deployment of the new Soviet theater nuclear systems and specifically promised that the SS-20 missile and Backfire bomber would be included within the framework of SALT II. (Schmidt, 198 , p.170) In a July 1977 meeting at the White House with President Carter and national security adviser Zbigniew Brzezinski, Chancellor Schmidt personally expressed these same concerns with the new American president, seeking similar assurances they would be included in a SALT II treaty. Schmidt recalls in his autobiographical work *Men and Powers*, that he was certain "Carter had given no thought to including the Eurostrategic SS-20 intermediate-range missiles and the Backfire bomber ... in the limitation of strategic weapons he had in mind." (Schmidt, 1989, p.184) In general, Washington's response to the German statesman was a reminder that American strategic nuclear forces provided ample target coverage of the Western USSR and for that reason the alliance had long foregone the capability to strike Soviet territory from the European continent. U.S. Thor and Jupiter IRBMs and MRBMs had been

removed from Italy and Turkey by 1964 following the Cuban missile crisis. (Thomson, 1984, p.603) This argument, in effect ignored Schmidt's concern about the effects of strategic nuclear parity weakening extended deterrence and left the Chancellor thinking the administration was only interested in reducing the strategic threat to American territory without being bothered by European security interests. (Schmidt, 1989, p.185)

As a result, German-American relations grew even farther apart throughout the summer months, significantly strained by the "neutron bomb" debate that had begun in July to be followed with a press leak in early August that reported the White House to be considering a possible modification of NATO's forward defense strategy in its most recent national security reassessment, Presidential Review Memorandum 10 (PRM-10).

First, the enhanced radiation warhead, or "neutron bomb" as it became known in public debates, intensified prompt nuclear radiation energy in the form of neutrons more than ten times that of previous tactical nuclear weapons. This radiation emphasis made it possible, by bursting ER weapons at sufficient altitude, to incapacitate military personnel without the attendant destructive physical effects of blast and heat reaching the surface. (Yost, 1982, p.529)

Opponents argued that the neutron bomb was *immoral* because it would 'kill people but spare buildings'. In July

1977, Egon Bahr, secretary general of the Social Democratic party and architect of Willy Brandt's *Ostpolotik* called the neutron bomb a "symbol of the perversion of thought." (Herf, 1990, p.61) Proponents of the weapon countered that it was no more immoral than any other horrible weapon of war, either conventional or nuclear, in the NATO arsenal; but that the damage limitation capability of this weapon would help limit escalation and thereby strengthen the credibility of "flexible response." Manfred Worner, then a leading CDU defense expert in parliament said, "Precisely because this weapon reduces collateral damage for the civilian population, its use is more credible, the risk is higher and thus deterrence and war prevention is more effective." (Herf, 1990, p.61)

Chancellor Schmidt was given little room to maneuver on the issue since the majority in his own ruling Social Democratic Party shared Egon Bahr's moral revulsion of the weapon, yet he was reluctant to force a direct confrontation with the new American leadership over this issue. If the Americans and NATO insisted on deploying the neutron bomb in West Germany, then Schmidt would go along. But, for obvious domestic political reasons "he was in no position to petition these weapons." (Schwartz, 1983, p.209) Yet, for domestic political reasons of his own, this is precisely the "condition" President Carter required for a positive U.S. production decision.

Meanwhile, on August 3, 1977 the *Washington Post* reported that a recently completed interagency review of U.S. defense policy, PRM-10, advocated NATO consider the Weser-Lech line as its main line of defense. This would in effect concede about one third of West German territory in the event of Warsaw Pact aggression, in contrast to NATO's longtime strategy of "forward defense," the cornerstone of West German defense policy. (Schwartz, 1983, p.213) The Carter administration vehemently denied the reports, claiming the line had been mentioned notionally as a method for calculating NATO defense planning requirements, however, the incident illustrated the Carter administrations complete lack of sensitivity about European security interests, issues and requirements, a fact that infuriated European leaders, none more so than Schmidt.

Chancellor Schmidt reacted to Washington's insensitivity by going public with his worries in a speech before the International Institute for Strategic Studies (IISS) in London on October 28, 1977. In his speech, Schmidt made a more explicit argument for including Eurostrategic systems in superpower negotiations:

> Changed strategic conditions confront us with new problems. SALT codifies the nuclear strategic balance between the Soviet Union and the United States. To put it another way: *SALT neutralizes their strategic capabilities*. In Europe this magnifies the significance of the disparities between East and West in nuclear tactical and conventional weapons. (Schmidt, 1977, p.3) [Emphasis added]

The Soviet Union had deployed medium-range SS-4 and SS-5 nuclear missiles along with numerous Badger and Bison medium-range bombers since the mid-1950s that were directed at Western Europe. Therefore, it wasn't the fact that the Soviets were deploying new missiles and bombers that upset Schmidt, it was the political leverage these forces might provide the Soviets in light of the "neutralization" of American strategic nuclear forces. If the United States would be in any way deterred from coming to Western Europe's defense by the growth of Soviet intercontinental nuclear weapons--as it was thought they might be--then the relative pressure and threat emanating from Soviet medium-range weapons directed at Western Europe would increase dramatically. As author Jeffrey Herf has pointed out, "This was the meaning of 'decoupling', the nightmare of NATO strategists," and even more so the Federal Republic of Germany. (Herf, 1990, p.55)

In light of his failed attempts to impress his point with the American President, Schmidt added new emphasis in his IISS speech to the importance of maintaining the military balance along the full spectrum of deterrence.

> Strategic arms limitations confined to the United States and the Soviet Union will inevitably impair the security of the West European members of the Alliance *vis-a-vis* Soviet military superiority in Europe if we do not succeed in removing the disparities of military power in Europe in parallel to the SALT negotiations. So long as this is not the case we must maintain the balance of the *full range* of deterrence strategy. *The Alliance must, therefore, be ready to make available the means to support it present strategy,* . . . (Schmidt, 1977, p.4)

It was only by going public with his argument that Schmidt was able to convince Washington that non-strategic nuclear weapons possess as much political value to Europeans in general and Germans in particular, as strategic nuclear weapons have for the United States and the Soviet Union. The Chancellor's pronouncements quickly gathered support in Europe and within six months NATO had established a High Level Group (HLG) under the auspices of the NPG to study the problems highlighted by Schmidt.

A Eurostrategic balance could be accomplished in either of two ways: One would be for the Soviet Union to withdraw its theater nuclear forces already deployed; the other would be for the Western alliance to build-up its theater nuclear capability to counter the Soviet threat. Naturally, Schmidt preferred the first option, but could not realistically expect the Soviets to surrender their military advantage through a unilateral force reduction without of course some incentive to do so from the West. Schmidt's implicit request for the deployment of NATO long-range theater nuclear forces to restore the "Eurostrategic" military balance "was the essential prerequisite for sustaining the European political balance and retaining an important German voice in the management of the Western alliance." (Hanrieder, 1989, p.112)

In April 1979 the HLG submitted its final report to the NPG with the following recommendations:

- NATO should modernize its LRTNF through an evolutionary upward adjustment.
- The deployment package should consist of land-based cruise missiles and ballistic missiles. (A SLCM option was considered but decided against because of limited visibility of sea-based systems).
- The total number of missiles deployed should be greater than 200, in order to have a substantial effect, but less than 600, so that the possibility of decoupling would not be too great.
- Deployment should be shared among as many NATO allies as possible.
- A final decision on LRTNF should be made before December 1979 to avoid complications that might arise during West German elections in 1980. (Schwartz, 1983, p.227)

On 12 December 1979 the NATO council of foreign and defense ministers in Brussels announced the "two-track" decision to deploy 572 medium-range nuclear weapons (108 Pershing II ballistic missiles and 464 ground-launched cruise missiles) and simultaneously to offer to begin arms control negotiations with the Soviet Union "as soon as possible." Along with the deployment decision, NATO announced the withdrawal of 1000 tactical nuclear warheads from Western Europe, to avoid the impression that NATO was "packing" Central Europe with more nuclear arms.

The December 1979 NATO decision was a short-lived victory for Chancellor Schmidt as later that same month the U.S. Senate Committee on Armed Services rejected the SALT II Treaty recommending major changes and the Soviet Union invaded Afghanistan. The combination of these two events put to a halt

the arms control track of the "two-track" approach. Additionally, in August 1980, the Carter administration published Presidential Directive - 59 (PD-59), also known as the countervailing strategy. The countervailing strategy was designed to provide the National Command Authority with selective and measured nuclear options to a less than all-out Soviet attack utilizing whatever level of response was deemed appropriate for the aggression taken.

The cumulative effect of these occurrences was a fundamental reinterpretation of NATO's 1979 decision. Rather than being the result of West German concerns, it became the product of American pressure. (Herf, 1990, p.119) Rather than couple the United States to Western Europe more firmly, the decision was labelled as an attempt by American "warfighters" to limit nuclear war to Europe and the Soviet Union.

This incredible reinterpretation of the NATO "dual-track" decision brought renewed spirit into the European peace/anti-nuclear movement which began to vigorously protest against the NATO missile deployments. Within his own SPD Party, Schmidt received enormous pressure to reverse his support for the NATO decision. In order to quiet the growing opposition Chancellor Schmidt and foreign minister Genscher urged the United States to adopt a "zero option" as the goal of the INF negotiations. (Herf, 190, p.135) President Reagan offered the Soviets this so-called "double-zero" option publicly in November 1981 with the strong belief that the USSR would never accept a zero

level, thereby giving the U.S. president a "magnificent political ploy." (Rogers, 1988, p.114)

On 22 November 1983 a final resolution supporting the deployment of the Pershing II and GLCM missiles passed in the Bundestag. Almost exactly as had been the case 25 years earlier for the vote on initial deployments, the voting was split solidly along Party lines. The following week, the first Pershing II missiles arrived in Germany and the Soviet Delegation walked out on INF negotiations in Geneva the following day.

Following the Reykjavik Summit in October 1986, however, West European leaders were faced with the surprising possibility that General Secretary Gorbachev was willing to accept the zero-level proposal. It was only then that they realized they had been painted into a political corner, unable to explain to their publics that the zero-option was actually not in their best interests without losing their political credibility. General Bernard Rogers exclaimed: "It was at that point that political credibility and expediency took priority over the credibility of NATO's deterrence." (Rogers, 1988, p.115)

The INF Treaty was signed by President Ronald Reagan and General Secretary Mikhail Gorbachev on December 7, 1987 and ratified by the United States Senate on May 27, 1988. The treaty directed the elimination of all U.S. and Soviet intermediate-range land-based missile delivery systems. For

the Soviet Union this meant the elimination of all SS-4, SS-12/22, SS-23, and SS-20 ballistic missiles and the SSC-X-4 cruise missile. On the U.S. side, the treaty bans all ground-launched cruise missiles (GLCM's) and the Pershing II intermediate range ballistic missile. In addition, outside the framework of the INF Treaty, West Germany has unilaterally agreed to dismantle its 72 shorter range Pershing IA's. The INF Treaty does not however, apply to sea-launched or air-launched cruise missiles (SLCM's or ALCM's), to dual-capable aircraft (DCA) or to short-range nuclear forces. Nor does it apply to British or French nuclear forces. (Bitzinger, 1989, p.7)

Strategically, it is believed by many that the INF Treaty seriously crippled the Atlantic Alliance's capacity for flexible response along a "continuum of deterrence" necessary to counter the Soviet arsenal of diverse weaponry. (Kirkpatrick, 1988, p.72) At a March 1988 conference of U.S. and West European defense analysts and government officials, several European participants expressed the belief that, "By removing an important and hitherto weak link in NATO's chain of nuclear forces, the treaty took a few rungs out of the West's "ladder of escalation." It also raised anew the old debate over "decoupling" - that is, over breaking the link between a war in Europe and U.S. strategic nuclear forces." (Bitzinger, 1989, p.7)

From a European perspective, the elimination of intermediate-range nuclear missiles greatly reduces NATO's ability to conduct a deep strike onto Soviet soil fulfilling the need to punish Soviet aggression; however, from the American perspective, the elimination of LRINF missiles significantly lowers the threshold of strategic nuclear escalation, thus endangering the U.S. homeland.

General Bernard Rogers expressed further concern that the Treaty "puts Western Europe on the slippery slope of denuclearization, something the Soviets have wanted ever since the United States began to deploy nuclear weapons in Western Europe. It makes Europe safe for conventional war." (Rogers, 1988, p.104)

General Rogers' comments may at first appear overly dramatic. However, the political momentum has certainly shifted in the direction of denuclearization since the time of his testimony. Fueled by Soviet unilateral force reductions in Eastern Europe, and a Soviet call for a global ban on all weapons of mass destruction (both nuclear and chemical), there has indeed been further "slippage." Some European analysts believe that the whole INF process has left an indelible mark on West European politics. As Richard Bitzinger has observed during a recent conference discussing NATO strategy for the 1990's, "In the opinion of one European at the conference, it has unleashed a "political maelstrom" within the Federal Republic over the future of nuclear forces there." (Bitzinger,

1989, p.7) Recent statements by the German Social Democratic Party (SPD) support this observation. An SPD statement released in March 1990 called for the elimination of the concept of atomic deterrence and the removal of all atomic and chemical weapons from German soil. (Wieczorek, 1990, p.1)

General John Galvin, SACEUR, recently wrote:

> The deterrent value of theater-based nuclear systems rests on the willingness of all nations of the alliance to support the nuclear aspects of the strategy of flexible response. It is important that all of these [NATO] countries, not just a small number, agree on modernization of the nuclear deterrent. This must be an alliance decision whose costs - both economic and political - are shared by all. (Galvin, 1989, p.91)

Richard Bitzinger of the RAND corporation points out that: "It would not be easy to go to the people of Western Europe and the United States and argue that, after signing a popular arms control treaty, NATO must now procure new forces that appear, in effect, to circumvent the spirit of that treaty." (Bitzinger, 1989, p.21)

III. REFORMULATING NATO STRATEGY

A. BACKGROUND: "FLEXIBLE RESPONSE"

The NATO Doctrine of "Flexible Response" was adopted by the Defense Planning Committee in ministerial session in March 1967, and is contained in Military Committee document 14/3, the "Overall Strategic Concept for the Defense of the NATO Area." (Sinnreich, 1975, p.461) With the exception of France, all military members base their common defense on this strategy. As Michael Legge describes it, "The strategy set out in MC 14/3 seeks to deter aggression by the maintenance of conventional, theatre nuclear, and strategic nuclear forces that would enable the Alliance to respond to any attack at an appropriate level." (Legge, 1983, p.9) NATO's initial response would be direct defense, seeking to defeat the assault on the level at which the enemy had chosen to fight. Legge further adds, "If the aggression could not be contained, the Alliance would be prepared to conduct a deliberate escalation, raising but where possible controlling the scope and intensity of combat, with the aim of making the cost and risk disproportionate to the aggressor's objectives and the threat of nuclear response more imminent." (Legge, 1983, p.9) The ultimate objective, if should deterrence fail, would be to convince the aggressor of the unacceptable degree of risk

involved, thus causing him to cease his attack and withdraw. Finally, in the event of a major nuclear attack, NATO would preserve a capability for a massive strategic nuclear response. (Legge, 1983, p.9)

Flexible response replaced what most believed to be an incredible strategy of "massive retaliation," which relied almost exclusively on the threat of U.S. strategic nuclear retaliation, to deter any but the most limited threats to the Atlantic Alliance. (Sinnreich, 1975, p.462) The doctrine of "massive retaliation" lost most of its credibility as a deterrent with improvements in Soviet strategic capabilities throughout the 1960's, thereby placing a larger threat of Soviet response in kind on U.S. cities. European leaders soon began to doubt the willingness of American leaders to risk attacks on American cities for their own as a consequence of Soviet aggression in Europe.

1. Hierarchy of Potential Levels of Deterrence

"Flexible response" was developed to eliminate the gap between conventional war and 'spasm' nuclear retaliation by deliberate but controlled escalation through a range of possible intermediate levels of potential violence as required. Paul Nitze, former Deputy Secretary of Defense (1967 - 1969), has classified ten suggested levels of potential violence - or levels of deterrence - in which the

relationships between conventional, theater nuclear, and strategic nuclear force capabilities interact:

Strategic Nuclear Forces	1. Intercontinental, primarily countervalue, nuclear war.
	2. Intercontinental, primarily counterforce, nuclear war.
Theater Nuclear Forces	3. Theater nuclear war in which intermediate gray area weapons, such as the SS-20, Backfire, G-Forces class submarine, FB-111, intermediate range cruise missiles, and the like are used.
	4. Forward Edge of the Battlefield (FEBA) nuclear war with both sides primarily using shorter range weapons close to the line of contact between opposing forces; neither superpower using its intercontinental or gray area weapons, and both superpowers avoiding the territory of the other.
	5. Unilateral use by the country attacked of tactical nuclear weapons in self defense on and over its own territory.
Conventional Forces	6. Conventional war with both superpowers participating.
	7. Conventional war with only a single superpower actively participating.
	8. Conventional war with the client states only participating.
	9. Civil war or guerilla war in its various forms.
	10. Political, economic, and psychological warfare.(Nitze, 1977, p.122)

The Atlantic Alliance recognized and was willing to accept the possibility that failure to contain enemy aggression on the conventional level would result in deliberate escalation of war to a nuclear level, and that once that level had been reached, that it would be very difficult to control further escalation. Both Europeans and Americans accepted these risks, but for contradictory and somewhat selfish reasons. The Europeans did so because they believed

that "the threat to use theater nuclear weapons (TNW) represented the best way of "coupling" the U.S. strategic deterrent to the defense of Europe, and the Americans because it offered "the best hope of preventing a major land battle in Europe from escalating to an all-out strategic exchange." (Legge, 1983, p.10) Both sides of the Atlantic, therefore, perceived advantages to be gained through acceptance of the new doctrine. Richard Sinnreich notes that, "More important, however, adoption was achieved by framing the doctrine in terms sufficiently ambiguous to enable all participants to interpret it as they please." (Sinnreich, 1975, p.463) Over the years this ambiguity has served alliance cohesion well while also adding a measure of uncertainty to any opponents calculations as to the exact nature and scale of a response.

B. THE DETERRENCE DEBATE WITHIN NATO

Once the doctrine of "Flexible Response" had been adopted by the Atlantic Alliance, the Nuclear Planning Group (NPG), established in April 1967 to give non-nuclear Allies a consultative role in decisions over the use of nuclear weapons, was charged with the responsibility of developing political guidelines for the use of Theater Nuclear Weapons (TNW). Individual member countries, without direct involvement of the United States, were requested to work through in detail the possible implications of NATO first use of nuclear weapons

at theater level, since that was the prescribed action to be taken in accordance with the strategy.

The results of this work produced an Anglo-German paper, often referred to as the Healey-Schroeder report. The report, presented to and later approved by the NPG (after several amendments), was well received by the Allies. Michael Legge recounts that the most important reservations came from the Americans concerning the scale of first use:

> The Americans were anxious not to rule out as a possible option the initial use of theatre weapons on a substantial scale, perhaps running into hundreds of weapons. (This was a point on which the Germans in particular were understandably sensitive, given the possibility that many of the weapons might be used on German territory.) But this was the only significant manifestation of the views of adherents to the so-called "warfighting" school of thought - those who argue that once NATO has been driven to the point of using nuclear weapons (and bearing in mind Soviet declaratory policy, which calls for large-scale nuclear response to any NATO use of nuclear weapons), then the primary objective of such use should be to gain an immediate military victory, at least at the local level. . . . In the case of the initial use guidelines, however, despite reservations about the possible *scale* of use, the U.S. came down firmly in support of the view taken by the Europeans that NATO's *objective* would be essentially political and that initial use would therefore be very selective. (Legge, 1983, p.20)

The nuclear guidelines approved by the NPG could readily accommodate either view, "warfighters" or those who believed in the primacy of the "political signal", simply because of the ambiguity inherent in the doctrine of flexible response itself. At the heart of the debate over flexible response in general, lay a fundamental disagreement between the United States and its Allies regarding both the nature of deterrence,

and how its risks should be apportioned. (Sinnreich, 1975, p.463) The American "warfighters" in emphasizing the *flexible* nature of flexible response sought deterrence through an ability to ensure the 'denial' of enemy objectives. They advocated placing greater emphasis on denying territorial objectives to the enemy, by escalation to battlefield/tactical nuclear weapons equivalent to level five in the hierarchy of potential violence/deterrence. The European interpretation of the strategy aligns itself more closely with "deterrence by punishment", which places a greater emphasis on the threat of escalatory use of theater nuclear weapons to strike the enemy beyond the battlefield, preferably on his homeland, and thereby inflict extreme punishment on his assets. This interpretation places first-use at the equivalent to level three in the hierarchy outlined by Nitze in 1977.

Central to this debate is the question of the threshold at which NATO might make the choice to turn to nuclear weapons in order to avoid defeat at the conventional level. Clearly, the Americans would prefer a higher threshold, in order to reduce the risk of escalation to intercontinental nuclear war between the superpowers; while Europeans would prefer to lower the threshold, thus raising the stakes of any Soviet aggression. It has been argued that the credibility of the U.S. strategic guarantee is directly related to the level at which the nuclear threshold is set. The lower the nuclear threshold is

set, the lower the credibility of the U.S. commitment to use strategic nuclear weapons, and vice versa.

Robert Levine classifies the European and American differences by separating them into two major categories, "European Couplers and American Maintainers." He asserts "The West Europeans want a strategy that will maintain the credibility of the link between any potential conventional war on their continent and the American nuclear weapons that are counted on to deter its outbreak in the first place. The constraint is that the link to American nuclear forces cannot be so automatic as to scare Americans away from the initial engagement. The Americans want a strategy that will avoid invoking nuclear weapons. The constraint is that this must be done without breaking the link completely, so that the nuclear deterrent to Soviet aggression will remain credible enough to do its job." (Levine, 1988, p.56)

A criticism of the flexible response strategy has been that it was credible in a period of U.S. strategic nuclear weapons superiority, but that since the mid 1970's, when the Soviets achieved parity in strategic nuclear forces, the risks of escalation dominance by the Soviet Union have weakened its basic deterrent credibility. Dr. Henry Kissinger, Secretary of State for Presidents Nixon and Ford, spoke rather frankly of the European-American relationship in a 1979 NATO conference address in Brussels -

> Let us face it: the intellectually predominant position in the United States was that we had to retain full control of the conduct of nuclear war and we therefore had a vested interest in avoiding any "firebreak" between tactical nuclear weapons and strategic nuclear weapons. The very reasoning that operated against setting a rational purpose for strategic forces also operated against giving a military role to tactical nuclear forces. And this was compounded by the fact that - to be tactless - the secret dream of every European was, of course, to avoid nuclear war but, secondly, if there had to be a nuclear war, to have it conducted over their heads by the strategic forces of the United States and the Soviet Union. (Kissinger, 1979, p.8)

In short, the European interpretation of the flexible response strategy centers around self-preservation and protection from the devastation of modern conventional war as well as nuclear holocaust; Americans feel threatened by the potential escalation of nuclear warfare to their homeland. This means that for Europeans the strength of the American commitment is largely a political issue focused on the American willingness to honor its nuclear guarantee. The Americans, on the other hand, perceive flexible response as a military issue centered about the "threshold" level at which theater nuclear weapons will have to be used to avoid conventional defeat.

C. MAJOR POLITICAL-MILITARY ISSUES

Three primary factors - Political, Geopolitical, and Military - determine the character and composition of NATO's deterrent strategy. It is the relationship between these factors which distinguishes one strategy from another. All

three factors are important in the development of a strategy, however, political factors tend to outweigh other elements of the tripartite because political actions drive government leaders to adopt policies that make deterrent strategies plausible or implausible. Therefore, in order to help judge the direction with which the Atlantic Alliance is most likely to proceed with respect to future strategy options, special emphasis must be given to the examination of military-political issues most active in alliance discussions.

Political issues that are generally debated in the public regarding NATO's nuclear strategy are: arms control objectives, basing of nuclear weapons, coupling mechanisms for the US nuclear guarantee, the credibility of extended deterrence, the probability of escalation from conventional war in a crisis (threshold), and the proliferation of nuclear weapons. These issues are all closely interrelated, therefore it is difficult to discuss any one of these issues without crossing into another, however, an attempt will be made to address each individually. Specific military issues often do not enter the public debate however, recent strategic changes make it import to at least touch on the subject of targeting changes.

1. Arms Control

Arms control is an issue which is developing rapidly as a result of perestroika in the Soviet Union. Mentioned

previously were several arms control proposals and agreements that are currently being discussed. The START-1 treaty reducing the strategic nuclear arsenals of the two superpowers by nearly 50 percent has now been signed. Soviet leaders have come to realize that arms reductions are a much more effective method of reducing US influence in Europe than any 'Cold War' propaganda or show of force could have hoped to be.

Soviet literature now openly espouses the benefits of minimum deterrence with some civilian authors suggesting that the USSR could reduce the size of its nuclear forces to 500 warheads and still be able to maintain "minimum deterrence."[1] (Dvorkin, 1989, p.105) If the US were to agree to such drastically reduced levels it would be nearly impossible to maintain a credible extended deterrent without some sort of a major technological breakthrough. Instead, or until such a breakthrough, minimum levels should be negotiated that will allow for a credible extended deterrent to flourish.

Alexei Arbatov of the Institute of World Economy and International Relations (IMEMO), warns that "After the 50 percent reductions of strategic offensive weapons and after the elimination of medium-range and shorter range missiles in Europe, the time will very soon come when it will be

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[1] Colonel Vladamir Dvorkin and Colonel Valeriy Torbin, "On Real Sufficiency of Defense, Military Specialists' Point of View," on MOSCOW NEWS in English, 25 June 1989, reported in "Officials View 'Adequate Defense Sufficiency', FBIS: Soviet Union, (3 July 1989), 105.

impossible to proceed further without the participation of the other nuclear powers.[1] (Arbatov, 1990, p.42) The European nuclear powers may balk at such a proposal, believing they already maintain sufficiently low levels of forces that they are not a threat to other nations. Soviet insistence to include the European nuclear powers in superpower negotiations may collapse the entire process and allow the US and USSR to maintain superior strategic arsenals. This would stop the evolutionary process in a muted bipolar system, and favor the adoption of 'Resolute Deterrence'.

2. Coupling

Another issue closely linked to the question of weapons deployments is that of a 'coupling mechanism', or device used to link the US strategic nuclear systems with the security of the European continent. It is felt by many that if US interests are not on-the-line there would be little incentive for the US to take action in the event of a crisis. Long-range theater nuclear forces provided the most credible coupling mechanism for the alliance, however, those missiles are now gone.

Former British Prime Minister Margaret Thatcher in an interview shortly after the 1990 NATO London Summit, made it

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[1] Alexei Arbatov, "Rethinking Nuclear Deterrence: In Search of a New Basis for European Security," in Rethinking European Security, Furio Cerutti and Rodolfo Ragionieri, eds., (New York: Crane Russak, 1990), 42.

clear that she believed two things are fundamental to NATO strategy: "American forces on German soil accompanied by American nuclear weapons." (Thatcher, 1990, p.1) Although many would agree with Mrs. Thatcher on keeping American forces in Europe, the opposite may be said concerning nuclear weapons. The official line has generally been that nuclear forces played the coupling role, but according to retired U.S. Army General William D. Odom, "in reality it has always been the presence of U.S. ground forces in Central Europe... that have served as the most credible guarantee, especially in the eyes of the European publics and in the eyes of the Soviet leadership." (Odom, 1990, p.215)

A further coupling device that is less often mentioned is NATO's Nuclear Planning Group (NPG). It ensures non-nuclear Alliance partners participation in the formulation of Allied nuclear policy.

3. Credibility

George Thibault describes four methods of increasing the credibility of an extended deterrent:

1. Identify the protected state as if it were the '51st' state
2. Fail to prepare for conventional war (French approach)
3. Use American forces as a 'tripwire'
4. Deploy tactical nuclear weapons in the path of possible aggressors. (Thibault, 1986, pp.85-89)

If this prescription is correct, than it may be deduced that indeed the removal of American nuclear weapons and forces from Germany and the other European allies would weaken the credibility of the US guarantee. Geopolitical factors such as increased economic and political autonomy for Western Europe also contribute to a weakening of the trans-Atlantic link. This predicament has caused some to argue that the time is ripe for a NATO Multinational Force with US participation. (Young, 1990, p.1) US participation in such a force would provide a 'coupling mechanism', anchoring American forces in Europe and thereby reinforcing the credibility of the extended deterrent.

The development of a NATO Multinational Force with US participation would be an important factor in stabilizing the evolution of Alliance strategy at this phase, and strengthening the credibility of the US extended deterrent. If no coupling mechanisms are maintained in Europe, this would likewise be an indicator that NATO may be continuing toward a 'Minimum Deterrent' strategy.

4. Threshold

An issue of tremendous debate within the alliance and rekindled by the July 1990 NATO Summit is the question relating to the escalation of conflict from conventional to nuclear war, often referred to as the "threshold" argument. The London Declaration stated that due to the political and

military changes in Europe, the allies would be able to adopt a "new NATO strategy making nuclear forces truly weapons of last resort." (NATO Review, 1990, p.32) Both British Prime Minister Thatcher and French President Francois Mitterrand expressed concern at the Summit meeting over this proposal by President Bush.

The *Washington Post* reported that Mrs. Thatcher complained in a letter to President Bush that this phrase could undermine NATO's deliberately ambiguous strategy of "flexible response" to any Soviet aggression. The British leader suggested alternative wording in which nuclear armaments would be described as "weapons of war prevention" [emphasizing deterrence] rather than of "last resort." (Smith, 1990, p.23) The final Summit communique contained the phrase "there are no circumstances in which nuclear retaliation in response to military action might be discounted" (NATO, 1990, p.33) to the satisfaction of the British delegation. Since the adoption by NATO in 1967 of the "flexible response" strategy, NATO has purposely held out the possibility that it would use its nuclear weapons to halt an aggressor during any phase of a conflict.

The wording of this phrase may be interpreted by some as raising the nuclear threshold, thereby reducing NATO's commitment to use nuclear weapons at any phase. British and many American NATO supporters believe this ambiguity adds a measure of uncertainty into any opponents calculations thereby

increasing its deterrent stock. The "last resort" strategy element may even be loosely interpreted by some as being synonymous with a "no first-use" policy. Although this was certainly not the intent of American leaders, it seems to have become a de facto elevation of the nuclear threshold. The British reaction to the wording change illustrates Britains' desire to maintain the status quo for NATO and take a more cautious, measured approach toward developments in Central Europe.

Immediately prior to the July Summit there was optimistic speculation by some alliance observers that the new NATO strategy adjustments may bring France back into the fold. Francois de Rose, former French Ambassador to NATO, understood from initial reports that the "last resort" concept was remarkably similar to the French strategy of a "final warning". (de Rose, 1990, p.3) Nevertheless, as it turned out, French President Mitterrand did not read the shift in policy the same way, becoming quite miffed at the other NATO allies and disassociating himself from the London Declaration upon his return to Paris. French Defense Minister Chevenement declared that the two doctrines - NATO and French - were "diametrically opposed." (Chevenement, 1990, p.19)

French deterrent strategy declares that a "final warning" nuclear strike using sub-strategic nuclear systems will be launched early-on in a military aggression against French national security interests. If this measure fails to

halt the aggressor it is to be followed by swift and sure massive retaliation by French strategic nuclear systems. The French interpretation of NATO's declaration that nuclear weapons are truly weapons of "last resort" is that it permits an extended period of conventional war, before nuclear armaments would be used. President Mitterrand proclaimed his opposition to the NATO strategy commenting "that deterrence was designed to prevent war, to stop it from happening, no to win it."[1] (Mitterrand, 1990, p.11)

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[1] Francois Mitterrand, "Logically the French Army Deployed in Germany Should Return Home," LE MONDE interview, 8-9 July 1990, p. 5, translated and reprinted in " Mitterrand Comments on NATO London Summit, FBIS: West Europe, (9 July 1990), 11.

IV. NON-STRATEGIC NUCLEAR CORRELATION OF FORCES

The shift in emphasis toward an increased reliance on what has been dubbed "Intermediate Navy Nuclear Forces (INNF)," is not, as some might suggest "the European role the Navy has always wanted."[1] First and foremost, U.S. naval forces lack the requisite capability to dominate or threaten controlled escalation in a crisis situation where nuclear weapons might be called upon to halt even a circumscribed Soviet advance into NATO territory.[2] An analysis of the U.S. Navy's non-strategic nuclear capability in the European theater reveals significant deficiencies when compared with those of the Soviet Union. Additionally, the Navy's only air-delivered tactical nuclear strike bombs, the Mk-57 depth/strike bomb and the Mk-61/B strike bomb are rapidly approaching obsolescence, with many B-57 warheads already in the process of being retired without replacement. The B-90 nuclear depth/strike bomb that had been scheduled to replace both weapons has been canceled with no planned alternative.

Third, following the cancellation of the A-12 *Avenger* in January 1990 by Secretary of Defense Richard Cheney (naval

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[1] See James L. George, "INNF," U.S. Naval Institute *Proceedings*, Vol.113/6, (June 1987), 35-39.

[2] The "last resort" option is consider to be the only plausible scenario wherein the two nuclear superpowers would consider the use of nuclear armaments *vis a vis* one another.

aviation's number one priority aircraft and sorely needed replacement for the A-6E *Intruder*), the aircraft carrier is without a long-range, all-weather stealth aircraft until sometime after the turn of the century. The interim aircraft selection with which to "fill the void," is an advanced version of the F/A-18 *Hornet*. Despite its impressive speed and maneuverability the *Hornet* lacks the critical range capability to penetrate deep into hostile territory while at the same time keeping the aircraft carrier battle group "out of harms way."

This places the Navy in a difficult situation wherein it may lack the capacity to execute basic elements of our national military strategy: deterrence, forward presence, maritime superiority, and force projection. It has been successfully argued in the past that "the success of U.S. foreign and defense policy often rests on the Navy's ability to respond effectively to a wide variety of contingencies, including nuclear war at sea.... In particular, deterring nuclear war at sea and on land is of primary concern to the Navy's long-term planning efforts." (Kartchner, 1988, p.1)

If the Navy is to meet the challenges of a "New World Order," it will need to ensure that a "balanced" maritime non-strategic nuclear force posture is formulated. The declining value of strategic nuclear forces in world politics in a sense increases the relative significance of non-strategic nuclear systems. Consequently, the success of the United States'

evolving overall national warfighting strategy may very well hinge on the U.S. Navy's capacity to deter or win a limited nuclear conflict.

A. ATLANTIC TO THE URALS NON-STRATEGIC NUCLEAR BALANCE

Non-strategic nuclear forces consist of all ground-launched, sea-launched, and air-launched nuclear capable weapons with delivery ranges less than 5,500 kilometers (3,300 miles). The Soviet Union is reported to have an estimated 10,000 nuclear warheads available for the European theater of operations, while NATO is estimated to have less than 4,000. (Bajusz and Shaw, 1990, p.335) In the past three years theater nuclear force deployments in Europe have undergone some dramatic changes. In fact, so much has happened that if current trends continue, one authority predicts that U.S. and Soviet tactical nuclear warheads in the Atlantic to the Urals (ATTU) zone could well number under 500 each by the middle of this decade. (The International Institute of Strategic Studies [IISS], 1990, p.214)

Starting around the mid-1970s, land-based non-strategic nuclear forces have been subdivided by Western military analysts into three separate classes: battlefield/tactical, medium-range, and long-range theater nuclear forces.[1] These classes are distinguished solely by the

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[1] Maritime nuclear forces will be discussed separately in another section of this paper.

range of the weapons system in question. Battlefield nuclear forces (BNFs) have included weapons such as nuclear capable artillery, rockets, and short-range ballistic missiles having ranges under 100 kilometers (60 miles). The range of these systems limits their employment to the vicinity of the tactical battle. This has caused some to suggest that if NATO forces ever decided to use these weapons, their limited range alone may convey to an aggressor a desire to limit the escalation of a conflict. (Reed, 1983, p.35)

NATO has an estimated 5,705 nuclear capable artillery pieces consisting of both 8-inch and 155-mm caliber towed and self-propelled nuclear capable howitzers. NATO's principle ground launched nuclear weapons system is the *Lance* missile. The are 88 *Lance* missile launchers in Europe, distributed among three NATO allies -- Germany with 76 launchers, Italy with six, and the Netherlands with six. Each *Lance* has approximately 20 missiles with a range of 110km (66mi) (IISS, 1990, p.219)

On 3 May 1990 President George Bush announced his decision to terminate the Follow-on-to-*Lance* program (FOTL) while at the same time he canceled any further modernization of U.S. nuclear artillery shells deployed in Europe. Two months later, at the July 1990 London NATO Summit, it was further announced that once short-range nuclear force (SNF) negotiations were underway, the U.S. would propose to eliminate all nuclear artillery shells from Europe in exchange for reciprocal action

by the Soviet Union. The Presidents move terminating the FOTL program has been interpreted by some analysts as having set the stage for a U.S. proposal at forthcoming SNF negotiations that would call for total elimination of all short-range missiles in Europe. (Bajusz, 1990, p.336)

By comparison, the Soviet BNF arsenal is believed to contain some 6,628 nuclear capable artillery pieces of nine different types and three different tube sizes: 152-mm guns and Howitzers, 203-mm Howitzers, and 240-mm mortars. *Soviet Military Power 1990* asserts that Soviet artillery modernization has continued at an impressive rate. "About one-third of the howitzers and guns deployed in the ATTU zone now consist of modern, self-propelled systems. (U.S. Department of Defense, 1990, p. 77) Concurrent with the Soviet modernization effort, force structure changes that are reducing the size of the artillery force are also decreasing artillery batteries from six or eight guns to four guns throughout the force. "These changes result in qualitative improvement in Soviet artillery at the division level." (U.S. Department of Defense, 1990, p.56) Soviet ground forces also employ a nuclear capable FROG-7 (free rocket over ground) rocket. The FROG-7 rocket is an unguided, single stage, 70km range (42mi) surface to surface missile used to provide nuclear fire support at the division level.

As a result of the Conventional Armed Forces in Europe (CFE) Treaty concluded in Paris in November 1990, the Soviet

Union has agreed to destroy thousands of its artillery pieces (some of which are dual-capable). Yet, in a apparent attempt to circumvent the agreement, the very next month, the Soviet Red Army began the transfer of three motorized rifle divisions, along with their over 800 artillery pieces, to the Soviet Navy for "coastal defense," -- thereby exempting them from CFE limitations. These units were geographically distributed between Arkhangelsk (in the Leningrad Military District), Klaipeda (in the Baltic Military District), and Semferopol (in the Odessa Military District). (Global Affairs, 1991, p.19) Although an arrangement was eventually worked out that would include these forces as treaty limited equipment, the incident raised suspicions in the West about the sincerity of the Soviet's Defense reorganizational efforts.

While Soviet government spokesmen have indicated a certain willingness to go along with President Bush's suggestion of eliminating short-range nuclear forces, Soviet proposals differ from the U.S. one in at least one key area, geographic scope. One Soviet proposal calls for the "elimination through withdrawal" from a 'Central European zone' all nuclear artillery munitions as well as mines. Such an agreement would make a "virtue out of necessity" for Soviet ground forces leaving former Warsaw Pact states while still preserving the sanctity of weapons storage on Soviet "national territory." (Kortunov, 1991, p.48) This would give the Soviet Army a considerable stockpile of nuclear arms in the western Soviet

Union to draw from while NATO's nuclear arms would be forced from Germany and the Low Countries back across the Atlantic to the United States. This Soviet zonal approach is generally considered to be an attempt to "singularize" some NATO members thereby reducing NATO's cohesion.

The Soviet Union controls nearly twice the number of BNF warheads in their nuclear stockpile as NATO. If they were to find it in their interest to accept President Bush's offer to eradicate all nuclear artillery shells from Europe, a significant Soviet advantage in this area would be eliminated. If on the other hand, the Soviet leadership is unwilling (or unable) to part with their BNF stockpile, then NATO could face another tough modernization decision in the next decade.

Medium-range theater nuclear forces consist of those ballistic missiles and air-delivered nuclear weapons capable of delivery ranges between 100 to 1,000 kilometers (60 to 600 miles). These weapons would be used by NATO primarily to interdict advancing second echelon or "follow-on" forces in a ground assault to prevent reinforcement of the forward battle area. Because these weapons go beyond the "forward edge of the battle area" (FEBA) they are generally thought to represent a higher degree of escalation than the use of battlefield nuclear weapons alone.

American forces in NATO forward deployed some 402 medium-range strike aircraft on the continent for this role. The majority of which are the supersonic F-4 *Phantom*, and the

modern F-16 *Falcon*. NATO allies Belgium, Britain, Italy, Greece, the Netherlands, and Turkey collectively have an additional 898 dual-capable strike aircraft. These include the two American fighters mentioned above plus the F-104 *Starfighter* and the British *Tornado*. Unclassified estimates indicate that the largest number of NATO's nuclear gravity bombs are stored in Germany which has about 500 weapons. Britain is a close second with 400, and Turkey third with 225. Italy is believed to stock almost 200 bombs while Belgium, Greece, and the Netherlands each hold approximately 25 weapons. (Norris[c], 1990, p.48)

Soviet dual-capable medium-range air assets include approximately 825 MiG-27 *Flogger*, 488 Su-17 *Fitter*, and 757 Su-24 *Fencer* attack aircraft. The supersonic Su-24 Fencer (2.3 Mach) is the most capable deep interdiction aircraft in the tactical air force possesses a range of about 1,130km (678mi). The *Fencer* is an all-weather, low-altitude penetrator, reported to be highly capable in attacking fixed targets. (Cochran, 1989, p.234) The Su-17 *Fitter* tactical fighter-bomber has a radius of action around 680km (410mi) and is assigned a ground support/close air support role. It is reported to have poor cockpit visibility and turning capability, but is capable of fast acceleration up to speeds of 2.1 Mach. The supersonic MiG-27 *Flogger* (1.7 Mach) is the aircraft most often used in Soviet military exercises in the nuclear role. The MiG-27 is the most numerous tactical fighter

in the Soviet inventory and has a calculated mission radius of 600km (360mi). (Cochran, 1989, p.234)

Since Soviet troop withdrawals began from Central Europe in the Spring 1989, some 275 first-line Su-17 *Fitter*, Su-24 *Fencer*, Su-25 *Frogfoot* and MiG-27 *Flogger* attack aircraft have been transferred to Soviet Naval Aviation (SNA). "Land-based attack aircraft of both the Soviet Air Force and Soviet Naval Aviation have been performing an increased level of maritime strike activity over the last several years." (U.S. Department of Defense, 1990, p.85) Although these aircraft are declared to be intended primarily for wartime maritime strike role in defense of Soviet territory, nonetheless, they also furnish SNA with tremendous offensive potential on NATO's primarily maritime northern and southern flanks. The expanding role of Soviet Naval Aviation is most worrisome to NATO's allies positioned along the flanks, particularly Norway which has encountered the brunt of a Soviet build-up of forces on the Kola peninsula in recent years.

In forthcoming SNF negotiations the Soviet Union is expected to seek deep cuts both in nuclear-capable aircraft and their associated weapons which are qualitatively superior to Soviet systems. Furthermore, the USSR will probably attempt to limit modernization of current air-delivered weaponry and ban new types of weapons systems in order to block NATO's options for a new TASM (Kortunov, 1991, p.48). The removal of Pershing II missiles from Europe in accordance with the INF

Treaty has to a certain extent forced NATO to increase reliance on dual-capable aircraft (DCA) to cover targets beyond the FEBA. If the NATO stockpile of air-deliverable nuclear gravity bombs is captured by future arms control arrangements -- or a political decision to unilaterally withdraw these arms is made by the United States -- then carrier-based strike aircraft will be the only nuclear-capable assets in theater to cover this particular group of targets.

Soviet medium-range non-strategic forces are larger and more diverse than those of NATO. The Soviet Army West of the Urals has roughly 256 SS-21 *Scarab* and 564 SS-1c *Scud* mobile missile launchers. The SS-1c *Scud-B* mobile missile has been described as "the ground force's primary nuclear fire support means." (U.S. Department of Defense, 1988, p.55) It is a liquid fueled ballistic missile with a range of 300km (180mi) and a circular error probable (CEP)[1] of around 450 meters. The warhead is considered to be in the 1 to ten kiloton range. (Cochran, 1989, p.220) The SS-21 is a retargetable, vertically launched, guided missile with a range of 300km (180mi) and a reported accuracy of 30 meters. It is thought to be capable of carrying either a 10KT or 100KT yield warhead. Both the SS-21 and the FROG-7 are reloadable, and three ready to fire

[1] CEP (Circular error probable) is the radius of a circle around a target within which there is a 50% probability that a weapon aimed at that target will fall.

missiles are thought to be carried by a resupply vehicle deployed with the SS-21 launchers. (Cochran, 1989, p.197)

The SS-21's vertical launch capability reduces the amount of time it is required to spend in the open thereby reducing the weapons vulnerability to detection and destruction. The U.S. Department of Defense reported in 1990 that "The Soviet Union's SNF modernization program includes replacing FROG rocket launchers with SS-21 short-range ballistic missiles organized into brigades of 18 launchers each. This improved organizational structure increases flexibility and responsiveness; it also simplifies command and control." (U.S. Department of Defense, 1990, p.55) The mobility, flexibility, range and accuracy of the SS-21 missile systems make it the most capable fire support weapons system in the Soviet inventory and sought after target by NATO planners. Locating and destroying these missiles and launchers will be paramount to NATO's success in controlling escalation in a limited nuclear engagement because of their serious capacity for retaliatory strikes.

It has already been mentioned that the U.S. is expected to propose the elimination of all SNF missiles possibly seeking a "Third Zero." All Soviet systems comprising SNF missiles -- FROG, *Scud*, and the SS-21 -- are designed for conventional and chemical as well as nuclear weapons delivery. Therefore, in any future SNF negotiations the USSR is unlikely to accept significant reductions of SNF missiles because such a measure

would weaken its conventional force posture, separate from the effects on its nuclear forces. (Bajusz, 1990, p. 339) The Soviet Union are more likely to pursue limits on warheads than missiles, allowing them to retain the bulk of their forces.

Long-range theater nuclear forces (LRTNFs) include those missiles and nuclear-capable aircraft with delivery ranges between 1,000 km and 5,500 km (600-3,300mi). The INF Treaty has eliminated all American and Soviet land-based cruise missiles and ballistic missile launchers in this class, however, the INF treaty does not limit the deployment of nuclear-capable bomber aircraft in this range. The United States reportedly forward deploys an estimated 170 F/B-111 *Aardvark* medium-range bombers in the United Kingdom, each able to deliver three nuclear strike bombs. (Norris[d], 1991, p.48) The F/B-111 is also capable of carrying six nuclear short-range attack missiles (SRAM-A), but no known SRAM-A missiles are deployed outside of the United States. The deep strike penetration capability of the F-111 against modern Soviet air defenses has been a matter of NATO concern for the past decade. Recent reports indicate that beginning in 1992 the USAF will return two wings of the F/B-111s to the U.S. from Britain. They will be only partially replaced by "less than a wing" (about 50 aircraft) of nuclear capable F-15 *Eagles*. (Norris[d], 1991, p.48)

The Soviet Union maintains a large and highly capable long-range non-strategic nuclear bomber force of some 659

aircraft of three different types which are assigned to both the Strategic Air Army (SAA) and Soviet Naval Aviation (See Table 3 below). The twin turbojet Tu-16 *Badger* is the oldest of the three bombers, entering service in 1955, and is being replaced by the modern *Backfire*. It can be armed with either the AS-5 *Kelt* or the AS-6 *Kingfish* air-launched cruise missiles, and has a calculated radius of action of 2,180km (1,308mi). (IISS, 1990, p.223) The supersonic Tu-22 *Blinder* (1.4 Mach) was introduced in 1960. It has an estimated 1,500km (900mi) radius and is armed with the AS-4 *Kitchen* supersonic missile capable of both land attack and anti-ship missions. The variable-geometry (swing) wing Tu-26 *Backfire* is said to be "ideally suited" to its theater and naval anti-strike missions. (Cochran, 1989, p.233) The *Backfire* is superior to the *Badger* and *Blinder* in combat radius (4,430km/2,658mi), survivability, and weapons versatility. Its low level supersonic dash capabilities (1.92 Mach) make it a highly proficient weapon system for anti-carrier operations. The *Backfire* is armed with the AS-4 *Kitchen* missile and is also believed to carry the new AS-11 *Kiltar* short-range attack missile.

In summary, reductions in Soviet theater nuclear forces that have resulted from the INF Treaty, Soviet force reorganization, and the doctrine of "reasonable sufficiency" will diminish the capability of theater commanders to conduct nuclear operations in Europe. This does not mean, however,

that the importance of theater nuclear forces in Soviet strategy has decreased. Short-range nuclear forces withdrawn to Soviet territory remain readily available within the Western Theater of Operations. (U.S. Department of Defense, 1990, p.55)

B. SEA-BASED NON-STRATEGIC NUCLEAR FORCES IN EUROPEAN WATERS[1]

Of the five branches of the Soviet armed forces the Navy has the most types of nuclear weapons. (Norris[9], 1991, p.48) Although the number of warships in the fleet is declining, the number of Soviet naval strike aircraft is rapidly increasing, and the potential conversion of *Yankee*-class strategic missile submarines (SSBNs) to cruise missile carriers (SSGNs) and to attack submarines (SSNs) could significantly increase the number of nuclear weapons at sea. (Polmar, 1991, p.106)

Nuclear systems in the naval non-strategic force generally fall into a number of specific categories: anti-submarine

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[1] Whereas it is relatively simple to subdivide land-based theater nuclear forces into distinct and separate range groupings, because maritime warfare generally involves distances relative to other combatants separate from geographic reference, naval weapons systems are often discussed in terms of mission: tactical, effecting the outcome of a particular battle; or strategic, effecting the outcome of the war. With the introduction of the multi-mission Tomahawk cruise missile in June 1984, this distinction has become somewhat blurred. For the purposes of this discussion, however, the nuclear Tomahawk land attack cruise missile (TLAM/N) is considered to be a tactical/theater nuclear asset.

weapons, air-delivered weapons, anti-ship missiles, sea-launched cruise missiles, anti-air weapons, naval artillery, and coastal defense missiles. Unlike the U.S. Navy, the Soviet Navy maintains a robust non-strategic nuclear force posture.

A few of these categories contain only small numbers of nuclear weapons and will be discussed first. The Soviet Navy maintains a single coastal defense division armed with some 100 SSC-1b *Sepal* nuclear capable ground launched cruise missiles. Launch sites for these weapons exist at all four Soviet fleet areas: Baltic Sea, Black Sea, Northern, and Pacific Ocean. (U.S. Department of Defense, 1988, p.87) The Soviet Navy may also stockpile nuclear artillery shells for its 152-mm guns carried by five *Sverdlov*-class cruisers. (Cochran, 1989, p.37) In addition, the Navy is believed to own a number of nuclear capable sea-mines, but very little information is available regarding these weapons. The Soviet Navy operates three kinds of nuclear capable surface-to-air missiles (SAMs): the SA-N-1 *Goa*, the SA-N-3 *Goblet*, and the SA-N-6 *Grumble*.[1] Soviet naval SAMs are presumed to be carried on 47 different surface ships with a total stockpile of around 200 nuclear warheads for these systems. (Norris[g], 1991, p.48)

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[1] It is not certain whether the SA-N-6 *Grumble* is nuclear capable or not. It is deployed on nine cruisers of the Kirov-, Slava-, and Kara-classes which could give the Soviet Navy 30 ships with nuclear anti-air capability in the year 2000. See Norman Polmar, "Unilateral or Bilateral Nuclear Disarmament?" U.S. Naval Institute *Proceedings*, Vol. 117/2/1,056 (February 1991), 105-106.

The Soviet navy deploys five kinds of ASW nuclear weapons: nuclear torpedoes, SS-N-15 *Starfish* rocket delivered nuclear depth bombs, SS-N-16 *Stallion* ASW missiles, FRAS-1 (Free Rocket Anti-Submarine) rockets, and air-delivered nuclear depth bombs. The SS-N-16 is a missile-launched nuclear ASW torpedo and the SS-N-15 is a missile launched depth charge of low kilotonage. Both of these submarine-launched ASW weapons have a range of about 30 miles. Four SS-N-15 and SS-N-16 nuclear missiles are estimated to be deployed on each attack submarine capable of delivering these missiles, and one nuclear torpedo and one nuclear depth bomb exists for each appropriate delivery platform. The result is a total of some 1,300 nuclear ASW weapons (Norris[g], 1991, p.48) Soviet land-based maritime air-ASW deploys a large portion of its 57 Tu-142 *Bear* F and 38 Il-38 *May* in the waters around Europe.[1] (IISS, 1990, p.223) The Soviets also employ ASW helicopters deployed onboard aviation cruisers and guided missile cruisers to conduct ASW operations in forward areas. Roughly two-thirds of the total estimated 115 Ka-25 *Hormone* and 60 modern Ka-27 *Helix*-A ASW helos in the Soviet fleet can deliver nuclear depth bombs in European waters. It is calculated that there are about 400 nuclear depth bombs of two different types in

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[1] It was reported in July 1991 that the Be-12 Mail maritime patrol seaplane is no longer nuclear capable. See "Nuclear Notebook," *The Bulletin of the Atomic Scientists*, Vol.47, No.6, (July/August 1991), 48.

the Soviet arsenal; the newest version entering service "in the early 1980s." (U.S. Department of Defense, 1987, p.43)

The Soviet Navy as of mid-1991 has some 1,100 nuclear capable sea-launched cruise missiles (SLCMs) and anti-ship missile (ASM) launchers. The SLCMs are of seven different types: SS-N-3 b/a,c *Sepal/Shaddock*, SS-N-9 *Siren*, SS-N-12 *Sandbox*, SS-N-19 *Shipwreck*, SS-N-21 *Sampson*, SS-N-22 *Sunburn*, and the SS-NX-24.[1] All of these missiles with the exception of the SS-N-3a *Shaddock* and the SS-N-21 are dual-capable. All are also reported to be dedicated to anti-ship missions except for these same two missiles which are primarily designed for land attack roles. The SS-N-12 and the SS-N-19 are thought to have secondary land attack roles as well. (Cochran, 1989, p.38) The SS-N-21 *Sampson* with a range of 3,000km (1,620nm) is the latest Soviet SLCM to become operational and is remarkably similar to the U.S. Navy's *Tomahawk* land attack cruise missile. Speculation has been that the SS-21 probably can be launched from any appropriately modified modern nuclear powered general purpose submarine and that it is likely to be deployed against Eurasian theater strategic targets. Speculation has been that several specific platforms were under consideration for employment of the new land attack missile: the *Yankee Notch-*, *Akula-*, and possibly *Victor* III-

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[1] The SS-N-7 Starbright is reported to have been retired this year from all Charlie I- and Papa-class submarines. See "Nuclear Notebook," *The Bulletin of the Atomic Scientists*," Vol. 47, No.6, (July/August 1991), 48.

and *Sierra*-class nuclear powered submarines (SSNs). (U.S. Department of Defense, 1990, p.53) However, to date the new missiles have only been observed on *Akula*-class submarines.

The SS-N-3, introduced in 1962, and its successor the SS-N-12, introduced ten years later, were developed specifically to provide the Soviet Navy with an organic capability to attack U.S. aircraft carriers far from the USSR before they could reach striking positions. (Cochran, 1989, p.158) These missiles have calculated ranges of 450km (245nm) and 550km (300nm) respectively. Both weapons are launched from surfaced submarines and can be delivered in a rapid salvo from deck mounted launchers. The SS-N-19 with its 550km (300nm) range and the SS-N-22 with a 400km (216nm), which entered service in 1980, were also developed with the same purpose in mind. The SS-N-19 is deployed on two of the Soviet Navy's most heavily armed ships, the *Kirov*-class cruiser (20 missiles each) and the *Oscar*-class submarine (24 missiles each). These missiles are believed to be targeted "primarily against NATO battlegroups." (U.S. Department of Defense, 1988, p.83) The SS-N-22 has been described as the Soviets highest technology anti-ship missile and is deployed on *Sovremennyy*-class destroyers and *Tarantul* III-class patrol combatants. Both missiles have supersonic speed (2.5 Mach) and use terminal homing guidance to their target. With this high level of offensive nuclear striking power there can be little doubt that the Soviet Navy is prepared to wage a nuclear war at sea

if it should be called upon to do so by the Soviet leadership.

By comparison, the U.S. Navy maintains only three kinds of tactical/theater nuclear weapons systems: The Mk-57 nuclear depth/strike bomb, the Mk-61/B nuclear strike bomb, and the nuclear *Tomahawk* land attack cruise missile (TLAM/N). The Mk-57 is a lightweight, multipurpose bomb that can be delivered by helicopter or fixed wing aircraft as a depth bomb against submarines, as a free-fall airburst weapon or a retarded "laydown" bomb against surface targets. (Hanson, 1988, p.164) First introduced in 1963, the Mk-57 (B-57 warhead) has an approximate yield reported to be in the sub-kiloton to 20-kiloton range. (Polmar, 1991, p.105) There are an estimated 600 B-57 strike bomb warheads in the U.S. nuclear stockpile along with 550 B-57 depth bomb warheads. (Norris[f], 1991, p.49) The almost 30-year old B-57 warhead has been slated for retirement and replacement by the mid-1990s, however, replacement now seems doubtful following the cancellation of the proposed B-90 weapon.

Three U.S. Navy ASW platforms are certified to deliver the Mk-57 nuclear depth bomb: the carrier-based S-3A/B *Viking* fixed wing jet, the SH-3 *Sea King* helicopter, and the land-based P-3 *Orion* maritime patrol aircraft (MPA). There are approximately 75 S-3A/B *Vikings* with a range of 575 km (310nm) deployed aboard aircraft carriers assigned to the European theater. (IISS, 1990, p.218) The S-3A/B is assigned to provide outer zone (100-330nm) ASW in support of the aircraft carrier

battle group (CVBG). It is armed with 2 Mk-57 depth bombs. The SH-3 *Sea King* normally deploys onboard an aircraft carrier or escort ship to provide inner zone (out to 100nm) ASW. The SH-3 may be armed with one Mk-57 depth bomb. The SH-3 is currently being replaced in the fleet with the SH-60F *Seahawk* which is reportedly not nuclear capable. (Norris, 1990, p.48) The land-based P-3 *Orion* MPA is the Navy's principle open ocean air-ASW platform. The P-3's mission radius is greater than 1,100 km (594nm) and once "on-station" the aircraft can remain there for as long as eight hours. The *Orion* is thought to be armed with at least two Mk-57 depth bombs. (IISS, 1990, p.218)

Several other NATO countries operate a collective 63 maritime patrol aircraft which include the P-3 *Orion*, the highly capable British *Nimrod*, and the French *Atlantic*. In wartime NATO's non-nuclear allies -- the Netherlands, Norway, Portugal, and Spain -- would fly to NATO nuclear storage facilities where they could also be armed with B-57 nuclear depth bombs.

Until recently the U.S. Navy also owned anti-submarine rockets similar to the Soviet SS-N-15 and SS-N-16 as well as a nuclear capable surface to air missile. In the Spring 1989, however, the Navy decided to phase out three of its tactical nuclear weapons: the ASROC ship-launched ASW rocket, the SUBROC submarine-launched ASW missile, and the *Terrier* nuclear antiaircraft missile. The *Terrier* was the Navy's only nuclear capable air defense system. Its departure has left the Navy

with only conventional air defense weapons. Michael Gordon writing for *The New York Times* commented that "The move reflects budgetary pressures as well as growing sentiment in the Navy that short-range nuclear weapons for ocean combat with enemy submarines and airplanes have limited value in defending the fleet." (Gordon, 1989, Sec.1, p.1)

Certainly there have always been advantages and disadvantages to using nuclear weapons for anti-submarine warfare. On the one hand, the "lethal radius" of a nuclear weapon is much greater than that of a conventional weapon thereby helping the user overcome problems in resolving target ambiguity. It has generally been considered that this type of ambiguity resolution serves the Soviet Navy more so than the U.S. Navy which is considered to have more capable ASW sensors than the Soviet Union. However, against tommorrow's modern Soviet high-speed, double-hulled submarines there is always the danger that conventional U.S. torpedoes may at some point become ineffective. Proponents therefore recommend the Navy maintain a nuclear ASW capability to hedge against such unforseen circumstances. (Polmar, 1991, p.106)

On the other hand, the enormous lethal blast of nuclear weapons may also endanger their delivery platforms, either by blast effects or by radioactive contamination from the "base surge" as explosive energy from the underwater detonation rises to the surface. In addition, the tremendous amount of underwater turbulence resulting from the nuclear detonation

results in "blue out" for passive and active sonar, effectively blinding any sensor for a long time. (Hanson, 1988, p.206)

Perhaps most important in the Navy's decision to retire these tactical nuclear weapons, was the belief that they contributed very little to deterrence of a nuclear attack on U.S. naval forces. The capability to retaliate for a Soviet nuclear strike on an American vessel with a nuclear ASW rocket on a Soviet naval vessel was considered by most Navy officials to be insufficient to deter the initial attack. Instead, the Navy elected to shift toward a deterrent strategy that would hold at risk Soviet naval and air bases on Soviet territory.

This new approach was made possible in the mid-1980s only after the introduction of long-range TLAM/N missiles fired from submarines and surface ships which, by the time of this decision, had been widely dispersed throughout the fleet. Vice Admiral Henry C. Mustin, former Deputy Chief of Naval Operations for Plans, Policy and Operations explained the logic behind this decision: "If you want to deter [the Soviets] you have to deter them with a weapon that scares them the most. We now see that the thing that the Soviets are most concerned about is attacks on Mother Russia." (Gordon, 1989, Sec.1, p.28)

This decision marked a turning point in the way the U.S. Navy views its maritime theater nuclear force requirements. For tactical use at sea, the Soviet nuclear arsenal had become

far more robust than our own. Of particular concern, their large numbers of antiship cruise missiles targeted primarily against NATO carrier battlegroups. In addition, the Soviet Navy stands to gain the most from employment of nuclear weapons at sea due to the inherent vulnerability of large U.S. surface warships at sea. Therefore, the U.S. Navy essentially "abandoned the notion of nuclear warfighting and has shifted to a view of theater nuclear weapons that envisions them purely as deterrents to Soviet nuclear escalation." (Rhodes, 1990, p.101)

The Mk-57 nuclear depth/strike bomb has already been discussed as an ASW weapon. As a strike weapon the Mk-57 can be delivered by both Navy and Marine Corps A-6E *Intruder* and F/A-18 *Hornet* carrier based aircraft.[1] Both aircraft are also capable of delivering the Mk-61/B tactical strike weapon. The Mk-61/B, like the B-57, is a lightweight bomb that has been in service since 1975. (Norris[f], 1991, p.49) The B-61-2, -5 warhead is reported to have a yield in the 10 kiloton to 345 kiloton range with an estimated 625 warheads in the U.S. nuclear weapons stockpile. (Norris[f], 1991, p.49) The Mk-61/B has been replacing some of the aging Mk-57 strike bombs as they have become obsolete.

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[1] Not all F/A-18 aircraft are reported to be nuclear capable. Only a certain number of "specially wired" planes are able to perform nuclear missions.

The B-90 tactical nuclear depth/strike bomb was scheduled to enter the U.S. Navy inventory in fiscal year 1993. It was the only tactical nuclear weapon under development by the U.S. Navy . (Polmar, 1991, p.105) According to Robert S. Norris of the Natural Resources Defense Council, the Navy neglected to include the B-90 in its 1992 budget request and as a result funding for the weapon has been canceled. (Norris[d], 1991, p.48) The B-90 was thought by some to have survived earlier budget cutting because it was "free," meaning the cost of researching and producing the weapon is borne by the Energy Department, not the Navy.[1] Therefore, it seems unlikely that the Navy budget would be the deciding factor.

Further study reveals that problems plaguing the nuclear weapons industry may have had greater impact on a decision to cancel the B-90 than Navy policy or planning. In January 1990 the *Washington Post* reported that a "government source" asserted that "nuclear weapons production, which heretofore has been set by the Pentagon based solely on military requirements, is [now] being debated in an interagency process that is putting new emphasis on costs and Energy Department concerns about safety." (Pincus, 1990, p.A6) With the perceived reduction of the Soviet threat and a reduced

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[1] See Damian Durrant and Joshua Handler, "Deep Six the B-90 Bomb," *The Bulletin of the Atomic Scientists*, Vol.46, No.5, (June 1990), 20.

emphasis on ASW in the U.S. Navy support in Washington for the B-90 seems to have evaporated.

The impact of the B-90 nuclear depth/strike bomb cancellation will be felt mostly by maritime air-ASW forces as the Mk-57 depth bomb is retired without replacement. In the past year alone, the B-57 depth bomb stockpile was reduced by one-third from an estimated 825 warheads in June 1990 to an approximate 550 warheads in June 1991. (Norris[f], 1990/1991, p.48/49) At this rate of retirement, by mid-1993 the U.S. Navy nuclear depth bomb stockpile will be entirely depleted. Similarly, the B-57 nuclear strike bomb stocks declined by nearly 25 percent, from 775 warheads in mid-1990 to 600 warheads today. (Norris[f], 1990/1991, p.48/49) Without a replacement weapon system the B-57 strike bomb stockpile will be empty by the middle of the decade. This would leave the Navy with a stockpile of nuclear air-deliverable strike bombs of around 625 weapons by the middle of the decade (assuming no further reductions in the B-61-2,-5 stockpile).

This stockpile would then have to be divided between the Atlantic and Pacific commands which would leave roughly 300 warheads available for use in the European theater. If 25 percent of these weapons are held in reserve then SACEUR is left with about 225 sea-based nuclear gravity bombs to carry forth theater nuclear operations. Would this be enough weapons to accomplish NATO policy objectives in support of ground forces? According to Colonel Jean Reed, U.S. Army, a typical

tactical nuclear weapons package might contain as many as 50-100 nuclear weapons. By definition "A package is a *discreet grouping* of nuclear weapons for employment in a *specified area* during a *short time period* to support a *corps tactical mission*." [italics in original] (Reed, 1983, p.42) Therefore, the theater commander would theoretically have only two or three packages available to "win the war."

The two U.S. aircraft carrier strike platforms that would deliver the Mk-57 and the Mk-61/B for the U.S. Navy and Marine Corps are the A-6E *Intruder* and F/A-18 *Hornet*. The subsonic A-6E *Intruder* has an unrefueled mission radius of approximately 1,250km (675nm). The A-6, first introduced in 1963 during the Vietnam war, can be armed with three nuclear weapons for delivery against surface targets at sea or on land. Normally there are ten A-6E attack aircraft per carrier airwing, however, future plans indicate this number may be increased to 14 as the number of carrier airwings are reduced from 15 to 12. Following the cancellation of the A-12 *Avenger* funding has been made available to modify nearly all A-6Es in the inventory to give it the necessary survivability through the 1990s. The new A-6Fs are scheduled to receive state-of-the-art electronics, weapons, and aircraft systems as part of an overall Systems Weapons Improvement Program (SWIP). (Serig, 1991, p.16) These modifications are designed to allow the A-6F to continue performing the long-range all-weather strike

mission until a new long-range stealth aircraft becomes operational sometime after the turn of the century.

The aircraft carrier's second nuclear strike platform, the F/A-18 *Hornet*, entered service in 1982 as a replacement for the venerable A-7 *Corsair*. The supersonic F/A-18C/D (2.2 Mach) has an estimated mission radius of 850km (460nm) unrefueled, and can be armed with two nuclear weapons. The *Hornet's* low radar cross-section, high-speed, maneuverability, and integrated weapons system performance make it a highly respected strike platform despite its range limitations. In fact, the Pentagon recently selected an advanced version of the F/A-18 *Hornet* over the F-14 *Tomcat* to "fill the void" left by the A-12 cancellation until the AX can be produced.[1]

The principle criticism of the F/A-18E/F selection is the limited range of the aircraft. The planned range of the A-12 was reported to "greatly exceed that of the A-6E." (Sweetman, 1990, p.323) However, the advanced F/A-18E/F chosen to fill the gap will have only about three-fourths the range of the *Intruder*. The aircraft's electronics, weapons and systems upgrades require major airframe-engine changes, a larger wing, higher thrust engines, and fuselage plugs to accommodate

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[1] The AX is to be the U.S. Navy's next generation Advanced Tactical Fighter currently under development. It is reported to be a totally modern aircraft, stealthy and with advanced engines and avionics with a range to match the A-12's, which it was suppose to escort. See Bill Sweetman, "Looking for the A-12 Alternative" *Jane's Defense Weekly*, 19 January 1991, p.80.

increased internal fuel. (Kennedy, 1991, p.165) Critics of the plan charge that "while additional fuel tanks would improve the aircraft's range to a degree, they were designed specifically to compensate for the additional empty weight of the F/A-18 E/F itself -- which will absorb much of the gains." (Kennedy, 1991. p.165) F/A-18 *Hornets* in the Gulf War have been criticized for their low payload-range capability, resulting in heavy aerial refuelling requirements. (Kennedy, 1991, p.165) For example, typical strike packages consisting of 24-26 aircraft on a 650 nautical-mile strike from the Red Sea required pre-target and post-target airborne refueling "to the tune of 514,000 pounds" for an F/A-18 Wing. (Mixson, 1991, p.39) This incredible fact prompted Rear Admiral Riley Mixson to proclaim: "By far, the most pressing need [for Navy strike assets] is to develop a true 700-nautical-mile standoff capability." (Mixson, 1991, p.39)

Range will surely be one of the most important considerations in planning and executing a limited nuclear strike utilizing carrier-based nuclear assets. There will always be a requirement to protect the "high value" aircraft carrier and this will undoubtably position it well "out of harm's way." Thus, ensuring the carrier's survivability will require that naval strike aircraft be capable of increasingly longer ranges to ingress cleanly to the target area without the need for refuelling from land-based tankers.

The U.S. Navy's third type of tactical/theater nuclear weapon system is the BGM-109A nuclear *Tomahawk* land attack cruise missile (TLAM/N). The TLAM/N subsonic cruise missile entered service in June 1984. It delivers a W-80 nuclear warhead with a selectable yield of five to 150 kilotons. (Polmar, 1991, p. 105) TLAM/N is deployed aboard *Los Angeles*-class submarines (SSNs), *Arleigh Burke*-class destroyers, *Spruance*-class destroyers, and *Ticonderoga*-class cruisers, all utilizing vertical launch systems (VLS). According to recent unclassified estimates, some 350 weapons are now in service. The originally planned goal of 758 weapons for 200 ships and submarines has been scaled down to 637 weapons for 175 platforms.

The TLAM/N flies at subsonic speed (540mi/hr) and has a range of approximately 2,500km (1,350nm). The "technical virtuosity" of the *Tomahawk's* guidance systems give it the reported capacity to come within 100 feet of the designated target with its 200 kiloton warhead. (Garrett, 1989, p.52) Deployment of the TLAM/N has dispersed the U.S. Navy's nuclear striking power amongst so many platforms that it would be virtually impossible for the Soviets to eliminate the American nuclear maritime retaliatory threat. (Friedman, 1988, p.119)

The TLAM/N could be assigned to any one of four distinct missions: a strategic nuclear attack on the Soviet Union or her allies, an attack on Soviet naval support facilities and maritime air bases, support for a general land battle, and

support for amphibious landings. (Garrett, 1989, p.55) Given the fact that the TLAM/N is a subsonic cruise missile most defense analysts agree that it is not particularly well suited for attacking time urgent strategic enemy targets such as missile sites or C^3 installations. Instead, the utility of this weapon is most often viewed in terms of its capacity "for attacking fixed, heavily defended, high-value targets where time is not of the essence and the use of ballistic missiles or manned aircraft is deemed politically imprudent or technically risky." (Bowen and O'Rourke, 1985, p.96)

According to Captain Linton F. Brooks, then assigned to the Staff of the Chief of Naval Operations (now Admiral Brooks, Director of Naval Intelligence), the TLAM/Ns primary role is to be a part of the strategic reserve force to be used only after the exchange of strategic nuclear weapons. (Brooks, 1985, p.128)

The second mission possible for TLAM/N, attack on Soviet naval support facilities and maritime air bases has already been suggested briefly as a punitive retaliatory measure in response to Soviet initiation of a nuclear war at sea. Therefore, in order to maintain the viability of this option a portion of the TLAM/N weapons stockpile would also need to be held in reserve to perform this mission.

If we somewhat arbitrarily divide the projected Tomahawk nuclear stockpile into quarters to contribute to each of the four mission areas, 50 percent of the total force would

theoretically already be eliminated from the theater commanders arsenal. The remaining 50 percent of all surface and submarine launched weapons would then be available for SACEUR in support of the land battle or an amphibious landing. Based on projected TLAM/N (W80-0) stockpile estimates into the second half of the decade, this would make available nearly 160 weapons. If you subtract another 25 percent of this total due to attrition during the conventional phase of the conflict, perhaps 120 weapons would be available.

Again, we must ask is this enough to meet U.S. and NATO policy objectives? If the objective is to fight and win a limited nuclear engagement, probably yes. Why? Because the greatest contribution which TLAM/N makes to the U.S. Navy is in the dispersal of its nuclear force amongst a variety of platforms capable of striking Soviet targets deep in the Russian homeland. For support of the inherently fluid land battle outside of the Soviet homeland, however, carrier-based strike aircraft are far superior in flexibility and responsiveness. Therefore, TLAM/N provides an extended deterrent "umbrella" over the carrier battle group.

V. CONCLUSIONS

The process of German denuclearization forms a central aspect of NATO nuclear strategy in the recent past and present. One might well argue that this trend is likely to increase in the foreseeable future if, in fact the alliance raises questions of nuclear weapons over the next three to five years. this development within German politics and society has decisive implications for the efficacy of alliance policy. The growing unwillingness of the defended to accept the means of their own defense forms an aspect of strategy that will loom quite large in the future. Certain necessary conclusions as regards issues of weapons development and tactics derive from this conclusion. These include:

- The U.S. Navy should develop and deploy a nuclear-capable long-range tactical air-to-surface-missile that would improve the range and survivability of U.S. naval strike forces against both enemy land an sea forces. An accurate air-deliverable nuclear stand-off missile would go a long way toward negating the Soviet Navy's capacity to dominate escalation in a future war-at-sea scenario.

- As USAF tactical nuclear weapons are removed from Europe, it will be essential that these weapons are made available for U.S. naval forces. Modifications to existing B-61 warheads would seem to be a much more cost effective replacement plan for retiring B-57 and B-61/B nuclear depth/strike bombs than resurrecting the B-90 program.

- Navy and Department of Defense officials should reconsider the selection of the F/A-18E/F as an interim weapon system for the canceled A-12. If indeed no other alternative is

found with suitable range characteristics and overall performance capabilities, then consideration should be given to "special wiring" for a nuclear strike version of the F-14 *Tomcat*.

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